



**HINDUSTAN  
UNIVERSITY**

HINDUSTAN INSTITUTE OF TECHNOLOGY & SCIENCE

**Department of Computer Applications**

**B.C.A. with specialization in  
Database System**

**Curriculum & Syllabus  
2014 Regulations**

## **ACADEMIC REGULATIONS–BBA/BCA/B.Com:**

### **1. Vision, Mission & Objectives**

**1.1** The Vision of the Institute is to make everyone a success and no one a failure

In order to progress towards the vision, the Institute has identified itself with a mission to provide every individual with a conducive environment suitable to achieve his / her career goals, with a strong emphasis on personality development, and to offer quality education in all spheres of engineering, technology, applied sciences and management, without compromising on the quality and code of ethics.

**1.2** Further, the Institute always strive

- To train our students with the latest and the best in the rapidly changing fields of Engineering, Technology, Management, Science & Humanities.
- To develop the students with a global outlook possessing, state of the art skills, capable of taking up challenging responsibilities in the respective fields.
- To mould our students as citizens with moral, ethical and social values so as to fulfill their obligations to the nation and the society.
- To promote research in the field of science, Humanities, Engineering, Technology and allied branches

**1.3** Aims and Objectives of the Institute are focused on

- Providing world class education in engineering, technology, applied science and management.

- Keeping pace with the ever changing technological scenario to help the students to gain proper direction to emerge as competent professionals fully aware of their commitment to the society and nation.

- To inculcate a flair for research, development and entrepreneurship.

### **2. Admission**

**2.1.** The admission policy and procedure shall be decided from time to time by the Board of Management (BOM) of the Institute, following guidelines issued by Ministry of Human Resource Development (MHRD), Government of India. The number of seats in each branch of the BBA / B.Com programme will be decided by BOM as per the directives from MHRD, Government of India and taking into account the market demands. Some seats for Non Resident Indians and a few seats for foreign nationals shall be made available.

**2.2.** At the time of applying for admission, the candidates should have passed / appeared and be awaiting results of the final examination of the 10+2 system or its equivalent study in the appropriate subjects of study.

**2.3.** The selected candidates will be admitted to the BBA / BCA / B.Com programme after he/she fulfills all the admission requirements set by the Institute after payment of the prescribed fees.

**2.4.** In all matters relating to admission to the BBA / BCA / B.Com programme, the decision of the Institute and its interpretation

given by the Chancellor of the Institute shall be final.

**2.5.** If at any time after admission, it is found that a candidate has not fulfilled any of the requirements stipulated by the Institute, the Institute may revoke the admission of the candidate with information to the Academic Council.

### **3. Structure of the programme**

**3.1.** The programme of instruction will have the following structure:

- i) A general programme of English, Tamil, other Languages and Applied Mathematics
- ii) A core programme introducing the student to the foundations of respective branch.
- iii) An elective programme enabling the student to opt and undergo a set of courses of interest to him/ her.
- iv) Professional practice including project, seminar and industrial training.
- v) General elective courses, such as, Environmental Studies, Physical Education, Professional ethics, and National Service Scheme.

The distribution of total credits required for the degree programme into the above five categories will nominally be 15%, 60%, 15%, 5% and 5% respectively.

**3.2** The duration of the programme will be a minimum of 6 semesters. Every branch of the BBA / BCA/ B.Com programme will have a curriculum and syllabi for the courses approved by the Academic Council.

**3.3** The academic programmes of the Institute follow the credit system. The general pattern is:

- One credit for each lecture hour per week per semester.
- One credit for each tutorial hour per week per semester.
- One credit for each laboratory practical of three hours per week per semester.
- One credit for 4 weeks of industrial training and
- One credit for 4 hours of project per week per semester

**3.4.** For the award of degree, a student has to earn certain minimum total number of credits specified in the curriculum of the relevant branch of study. The curriculum of the different programs shall be so designed that the minimum prescribed credits required for the award of the degree shall be within the limits specified below

Program	Minimum prescribed credit range
B.Com/BBA	135-145
BCA	115- 125

**3.5.** The medium of instruction, examination and the language of the project reports will be English.

### **4. Faculty Advisor**

to improve the teaching / learning process.

4.1. To help the students in planning their courses of study and for getting general advice on the academic programme, the concerned Department will assign a certain number of students to a Faculty member who will be called their Faculty Advisor.

## 5. Class Committee

5.1 A Class Committee consisting of the following will be constituted by the Head of the Department for each class:

- (i) A Chairman, who is not teaching the class.
- (ii) All subject teachers of the class.
- (iii) Two students nominated by the department in consultation with the class.

The Class Committee will meet as often as necessary, but not less than three times during a semester.

The functions of the Class Committee will include:

- (i) Addressing problems experienced by students in the classroom and the laboratories.
- (ii) Analyzing the performance of the students of the class after each test and finding ways and means of addressing problems, if any.
- (iii) During the meetings, the student members shall express the opinions and suggestions of the class students

## 6. Grading

6.1 A grading system as below will be adhered to.

Range of Marks	Letter Grade	Grade points
90-100	S	10
80-89	A	09
70-79	B	08
60-69	C	07
50-59	D	06
40-49	E	05
< 40	U	00
	I (Incomplete)	

## 6.2 GPA & CGPA

GPA is the ratio of the sum of the product of the number of credits  $C_i$  of course "i" and the grade points  $P_i$  earned for that course taken over all courses "i" registered by the student to the sum of  $C_i$  for all "i". That is,

$$GPA = \frac{\sum_i C_i P_i}{\sum_i C_i}$$

CGPA will be calculated in a similar manner, at any semester, considering all the courses enrolled from first semester onwards.

**6.3.** For the students with letter grade I in certain subjects, the same will not be included in the computation of GPA and CGPA until after those grades are converted to the regular grades S to F.

**6.4** Raw marks will be moderated by a moderation board appointed by the Vice Chancellor of the University. The final marks will be graded using absolute grading system. The Constitution and composition of the moderation board will be dealt with separately.

## **7. Registration & Enrolment**

**7.1** Except for the first semester, registration and enrollment will be done in the beginning of the semester as per the schedule announced by the University.

**7.2** A student will be eligible for enrollment only if he/she satisfies regulation 10 (maximum duration of the programme) and will be permitted to enroll if (i) he/she has cleared all dues in the Institute, Hostel & Library up to the end of the previous semester and (ii) he/she is not debarred from enrollment by a disciplinary action of the University.

**7.3.** Students are required to submit registration form duly filled in.

## **8. Registration requirement**

### **8.1. (i) BBA/B.Com**

The student shall not register for less than 16 credits or more than 28 credits in any given semester.

### **(ii) BCA**

The student shall not register for less than 14 credits or more than 24 credits in any given semester.

**8.2** If a student finds his/her load heavy in any semester, or for any other valid reason, he/she may withdraw from the courses within three weeks of the commencement of the semester with the written approval of his/her Faculty Advisor and HOD. However the student should ensure that the total number of credits registered for in any semester should enable him/her to earn the minimum number of credits per semester for the completed semesters.

## **9. Minimum requirement to continue the programme**

**9.1.** For those students who have not earned the minimum required credit prescribed for that particular semester examination, a warning letter to the concerned student and also to his parents regarding the shortage of his credit will be sent by the HOD after the announcement of the results of the university examinations

## **10. Maximum duration of the programme**

**10.1** The normal duration of the programme is six semesters. However a student may complete the programme at a slower pace by taking more time, but in any case not more than 10 semesters excluding the semesters withdrawn on medical grounds or other valid reasons.

## **11. Temporary discontinuation**

**11.1.** A student may be permitted by the Director (Academic) to discontinue temporarily from the programme for a semester or a longer period for reasons of ill health or other valid reasons. Normally a student will be permitted to discontinue from the programme only for a maximum duration of two semesters.

## **12. Discipline**

**12.1.** Every student is required to observe discipline and decorum both inside and outside the campus and not to indulge in any activity which will tend to bring down the prestige of the University.

**12.2.** Any act of indiscipline of a student reported to the Director (Academic) will be referred to a Discipline Committee so constituted. The Committee will enquire into the charges and decide on suitable punishment if the charges are substantiated. The committee will also authorize the Director (Academic) to recommend to the Vice-Chancellor the implementation of the decision. The student concerned may appeal to the Vice-Chancellor whose decision will be final. The Director (Academic) will report the action taken at the next meeting of the Council.

**12.3.** Ragging and harassment of women are strictly prohibited in the University campus and hostels.

## **13. Attendance**

**13.1.** A student whose attendance is less than 75% in a semester is not eligible to appear for the end-semester examination. The details of all students who have less than 75% attendance in a course will be announced by the teacher in the class. These details will be sent to the concerned HODs and Director (Academic).

**13.2** Those who have less than 75% attendance will be considered for condonation of shortage of attendance. However, a condonation of 10% in attendance will be given on medical reasons. Application for condonation recommended by the Faculty Advisor, concerned faculty member and the HOD is to be submitted to the Director (Academic) who, depending on the merits of the case, may permit the student to appear for the end semester examination. A student will be eligible for this concession at most in two semesters during the entire degree programme. Application for medical leave, supported by medical certificate with endorsement by a Registered Medical Officer, should reach the HOD within seven days after returning from leave or, on or before the last instructional day of the semester, whichever is earlier.

**13.3** As an incentive to those students who are involved in extra curricular activities such as representing the University in Sports & Games, Cultural Festivals, and Technical Festivals, NCC/ NSS events, a relaxation of up to 10% attendance will be given subject to the condition that these students take prior

approval from the officer – in-charge. All such applications should be recommended by the concerned HOD and forwarded to Director (Academic) within seven instructional days after the programme / activity.

#### 14. Assessment Procedure

**14.1.** The Academic Council will decide from time to time the system of tests and examinations in each subject in each semester.

**14.2** For each theory course, the assessment will be done on a continuous basis as follows:

Test / Exam	Weightage	Duration of Test / Exam
First Periodical Test	5%	1 Period
Second Periodical Test	10%	2 Period
Third Periodical Test	10%	3 Periods
End – semester examination	75%	3 Hours

**14.3.** For practical courses, the assessment will be done by the subject teachers as below:

- (i) Weekly assignment/Observation note book / lab records – weightage 60%.
- (ii) End semester examination of 3 hours duration including viva – weightage 40%.

**14.4** For courses on Physical Education, NSS, etc, the assessment will be as satisfactory/not satisfactory only.

#### 15. Make up Examination/Periodical Test

**15.1.** Students who miss the end-semester examinations / periodical test for valid reasons are eligible for make-up examination /periodical test. Those who miss the end-semester examination / periodical test should apply to the Head of the Department concerned within five days after he / she missed examination, giving reasons for absence.

**15.2.** Permission to appear for make-up examination / periodical test will be given under exceptional circumstances such as admission to a hospital due to illness. Students should produce a medical certificate issued by a Registered Medical Practitioner certifying that he/she was admitted to hospital during the period of examination / periodical test and the same should be duly endorsed by parent / guardian and also by a medical officer of the University within 5 days.

#### 16. Project evaluation

**16.1** For Project work, the assessment will be done on a continuous basis as follows:

Review / Exam	Weightage
First Review	10%
Second Review	20%
Third Review	20%
End - semester Exam	50%

For end – semester exam, the student will submit a Project Report in a format specified by the Director (Academic). The first three

reviews will be conducted by a Committee constituted by the Head of the Department. The end – semester examination will be conducted by a Committee constituted by the Registrar / Controller of examination. This will include an external expert.

## **17. Declaration of results**

**17.1.** A candidate who secures not less than 40% of total marks prescribed for a course with a minimum of 40% of the marks prescribed for the end semester examination shall be declared to have passed the course and earned the specified credits for the course.

17.2 After the valuation of the answer scripts, the tabulated results are to be scrutinized by the Result Passing Boards of UG and PG programmes constituted by the Vice-Chancellor. The recommendations of the Result Passing Boards will be placed before the Standing Sub Committee of the Academic Council constituted by the Chancellor for scrutiny. The minutes of the Standing Sub Committee along with the results are to be placed before the Vice-Chancellor for approval. After getting the approval of the Vice-Chancellor, the results will be published by the Controller of Examination / Registrar.

17.3. If a candidate fails to secure a pass in a course due to not satisfying the minimum requirement in the end semester examination, he/she shall register and re-appear for the end semester examination during the following semester. However, the sessional marks secured by the candidate will be retained for all such attempts.

17.4. If a candidate fails to secure a pass in a course due to insufficient sessional marks though meeting the minimum requirements of

the end semester examination, wishes to improve on his/her sessional marks, he/she will have to register for the particular course and attend the course with permission of the HOD concerned and Dean with a copy marked to the Registrar. The sessional and external marks obtained by the candidate in this case will replace the earlier result.

17.5. A candidate can apply for the revaluation of his/her end semester examination answer paper in a theory course within 2 weeks from the declaration of the results, on payment of a prescribed fee through proper application to the Registrar/Controller of Examinations through the Head of the Department. The Registrar/Controller of Examinations will arrange for the revaluation and the results will be intimated to the candidate concerned through the Head of the Department. Revaluation is not permitted for practical courses and for project work.

## **18. Grade Card**

**18.1** After results are declared, grade sheet will be issued to each student which will contain the following details:

- (i) Program and branch for which the student has enrolled.
- (ii) Semester of registration.
- (iii) List of courses registered during the semester and the grade scored.
- (iv) Semester Grade Point Average (GPA)
- (v) Cumulative Grade Point Average (CGPA).

## **19. Class / Division**

Classification is based on CGPA and is as follows:

CGPA  $\geq$ 8.0 : **First Class with distinction**



7.0 ≤CGPA < 8.0 : **First Class**

6.0 ≤CGPA < 7.0 : **Second Class**

5.0 ≤CGPA < 6.0 : **Third Class**

(branch) of his/her study within the stipulated time;

iii) Has no dues to all sections of the Institute including Hostels, and

iv) Has no disciplinary action pending against him/her.

## **20. Transfer of credits**

**20.1.** Within the broad framework of these regulations, the Academic Council, based on the recommendation of the transfer of credits committee so consulted by the Chancellor may permit students to earn part of the credit requirement in other approved institutions of repute and status in the country or abroad.

## **21. Eligibility for the award of BBA / BCA / B.Com. Degree**

**21.1.** A student will be declared to be eligible for the award of the BBA/BCA/B.Com Degree if he/she has

- i) Registered and successfully obtained credit all the core courses;
- ii) Successfully acquired the credits in the different categories as specified in the curriculum corresponding to the discipline

The award of the degree must be recommended by the Academic Council and approved by the Board of Management of the University.

**22.2** All students who have successfully completed the first semester of the course will be eligible for consideration for change of branch subject to the availability of vacancies.

## **23. Power to modify**

**23.1.** Notwithstanding all that has been stated above, the Academic Council shall modify any of the above regulations from time to time subject to approval by the Board of Management.

**SEMESTER I**

<b>Code no</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>TCH</b>
<b>THEORY</b>						
EL1105	English -1	4	0	0	4	4
MA1104	Applied Mathematics -1	4	1	0	4	5
BC1101	Computer Concepts & Problem Solving	3	0	0	3	3
BC1102	Digital Logic and Fundamentals	3	0	0	3	3
BC1103	Programming in C	3	0	0	3	3
<b>PRACTICALS</b>						
BC1121	Digital Laboratory	0	0	3	1	3
BC1122	Computer Concepts and Problem Solving Laboratory	0	0	3	1	3
BC1123	C Programming Laboratory	0	0	3	1	3
	<b>TOTAL</b>	<b>17</b>	<b>1</b>	<b>9</b>	<b>20</b>	<b>27</b>

**SEMESTER II**

Code no	Course Title	L	T	P	C	TCH
<b>THEORY</b>						
EL1106	English -II	4	0	0	4	4
MA1105	Applied Mathematics -II	4	1	0	4	5
BC1201	Data Structures	3	0	0	3	3
BC1202	Microprocessors and its applications	3	0	0	3	3
BC1203	Introduction to Accounting	4	1	0	3	5
<b>PRACTICALS</b>						
BC1221	Data Structures Laboratory	0	0	3	1	3
BC1222	Microprocessors Lab	0	0	3	1	3
BC1223	Accounting Laboratory	0	0	3	1	3
	<b>TOTAL</b>	<b>18</b>	<b>2</b>	<b>9</b>	<b>20</b>	<b>29</b>

### SEMESTER III

Code no	Course Title	L	T	P	C	TCH
<b>THEORY</b>						
MA1203	Applied Mathematics - III	4	1	0	4	5
BC1301	Algorithm Design Techniques	3	0	0	3	3
BC1302	Software Engineering	4	0	0	4	4
BC1303	Object Oriented Programming	4	1	0	4	5
BC1304	Computer Architecture	4	0	0	3	4
<b>PRACTICALS</b>						
BC1321	Object Oriented Programming Laboratory	0	0	3	1	3
BC1322	Algorithm Design Laboratory	0	0	3	1	3
BC1323	Software Engineering Lab 11	0	0	3	1	3
	<b>TOTAL</b>	<b>19</b>	<b>2</b>	<b>9</b>	<b>21</b>	<b>30</b>

### SEMESTER IV

Code no	Course Title	L	T	P	C	TCH
<b>THEORY</b>						
MA1204	Numerical Methods	3	1	0	4	4
BC1401	Operating Systems	3	0	0	3	3
BC1402	Computer Networks	3	0	2	4	5
BC1403	Database Management Systems	3	0	0	3	3
BC1404	Computer Graphics	3	0	0	3	3
<b>PRACTICALS</b>						
BC1421	Operating Systems Lab	0	0	3	1	3
BC1422	RDBMS Laboratory	0	0	3	1	3
BC1423	Computer Graphics Laboratory	0	0	3	1	3
<b>TOTAL</b>		<b>15</b>	<b>1</b>	<b>11</b>	<b>20</b>	<b>27</b>

### SEMESTER V

Code no	Course Title	L	T	P	C	TCH
<b>THEORY</b>						
BC1501	Multimedia Systems	3	0	0	3	3
BC1502	Internet Programming	3	1	0	4	4
BC1503	Compiler Design	3	1	0	4	4
-----	E1 Elective – I	3	0	0	3	3
-----	E2 Elective – II	3	0	0	3	3
<b>PRACTICALS</b>						
BC1521	Multimedia Systems Lab	0	0	3	1	3
BC1522	Internet Programming Lab	0	0	3	1	3
BC1523	Compiler Design Lab	0	0	3	1	3
<b>TOTAL</b>		<b>15</b>	<b>2</b>	<b>9</b>	<b>20</b>	<b>26</b>

**SEMESTER VI**

<b>Code No</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>TCH</b>
<b>THEORY</b>						
BC1601	Cryptography and Network Security	3	0	0	3	3
BC1602	Data Warehousing and Data Mining	3	0	2	4	5
-----	E3 Elective – III	3	0	0	3	3
-----	E4 Elective – IV	3	0	0	3	3
-----	E5 Elective – V	3	0	0	3	3
<b>PRACTICALS</b>						
BC1621	Web Applications Laboratory	0	0	3	1	3
BC1622	Project Work	0	0	12	6	12
	<b>TOTAL</b>	<b>15</b>	<b>0</b>	<b>17</b>	<b>23</b>	<b>32</b>

## SEMESTER – I

### EL 1105 - ENGLISH – I

(Common to all undergraduate branches)

**L T P C**

**4 0 0 4**

#### **UNIT I: LISTENING SKILL**

**12**

Listening to short conversations, telephone conversations and monologues – Listening to prose & poetry reading -- Listening to sounds and silent letters in English -- Listening to movies – Listening for the gist of the text -- Listening for general meaning and specific information -- Listening for multiple-choice questions -- Listening for positive & negative comments -- Listening for interpretation.

#### **UNIT II: SPEAKING SKILL**

**12**

Self-introduction -- Giving information about oneself -- Expressing personal opinion -- Simple oral interaction – Dialogue -- Conversation – Giving and receiving feedback using Johari window – Debates -- Brief presentations -- Differences between disagreeing and being disagreeable -- Participating in group discussions, role plays and interviews -- Generating talks based on visual or written prompts.

#### **UNIT III: READING SKILL**

**12**

Reading for skimming – Reading for scanning -- Reading for the gist of a text – Reading for specific information – Reading for information transfer and interpretation (pie chart & bar chart) -- Reading and interpreting anecdotes, short stories, poems – Reading prose passages for comments -- Reading and explaining a Fishbone diagram for pros and cons – Reading comprehension exercises for multiple-choice questions.

#### **UNIT IV: WRITING SKILL**

**12**

Writing emails, messages, notices, agendas -- Leaflets and brochures -- Writing paragraphs -- comparisons & contrasts -- Letter-writing -- letter to the editor -- Letter inviting, letter accepting or declining the invitation -- Arranging appointments -- Asking for permission -- Apologizing and offering compensation -- Dealing with requests -- Writing presentations with a plan -- Introduction, Body and Conclusion.

#### **UNIT V: THINKING SKILL**

**12**

Eliciting & imparting the knowledge of English using thinking blocks – Developing thinking skills along with critical interpretation side by side with the acquisition of English -- Decoding diagrams & pictorial representations into English words, phrases and expressions.

**Total No .of.Periods:60**

#### **REFERENCES :**

1. Norman Whitby. *Business Benchmark: Pre-Intermediate to Intermediate* – BEC Preliminary. New Delhi: Cambridge University Press, 2008 (Latest South Asian edition).
2. Devaki Reddy & Shreesh Chaudhary. *Technical English*. New Delhi: Macmillan, 2009.



## **BC1101-COMPUTER CONCEPTS & PROBLEM SOLVING**

**L T P C**  
**3 0 0 3**

### **UNIT I FUNDAMENTALS OF COMPUTERS 9**

Evolution of Computers – Inputs/Outputs – Alternative Methods of Input – Organization of Modern Digital Computers – Operating System – Multitasking OS – Graphical User Interface.

### **UNIT II WORD PROCESSING 9**

Word Processing Programs and Their Uses – Word Processor’s Interface – Editing Text – Formatting Text –Macro- Special Features of Word – Desktop Publishing Service – Converting doc into www pages

### **UNIT III SPREADSHEET SOFTWARE 9**

Spreadsheet Programs – applications – Spreadsheet package features, attributes - structure, label, data, importing data, formula, functions – data handling – Managing workbooks.

### **UNIT IV INTRODUCTION TO COMPUTER PROBLEM SOLVING 9**

Introduction – Problem Solving aspects-Top-Down Design-Implementation of Algorithms – Program Verification-Efficiency of Algorithms-Analysis of Algorithm-fundamental algorithm-factorial computation-generation of Fibonacci sequence.

### **UNIT V FACTORING AND ARRAY TECHNIQUES 9**

Factoring Methods-finding the square root of a number-generating prime numbers- Array techniques array order reversal-Finding the maximum number in a set- Removal of duplicates from an ordered Array-finding the kth smallest element.

**Total No.of.Periods: 45**

### **REFERENCES :**

- 1 Peter Norton,“Introduction to Computers”,4th Edition, TMH Ltd, New Delhi, 2001.
- 2 R.G. Dromey,“How to solve it by Computers”, Pearson Publishers, New Delhi, 2007.



## **BC1102 - DIGITAL LOGIC AND FUNDAMENTALS**

**L T P C**  
**3 0 0 3**

### **UNIT I INTRODUCTION TO DIGITAL DESIGN 9**

Binary Systems : Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic Boolean Algebra and Logic Gates: Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Digital Logic Gates.

### **UNIT II LOGIC GATES 9**

Minimization: K-Map Method – Table Method, POS - SOP, Don't Care Conditions, NAND, NOR Implementation, Introduction to HDL. Combinational Logic: Combinational Circuits, Analysis and Design Procedure, Binary Adder, Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers.

### **UNIT III SEQUENTIAL CIRCUIT 9**

Synchronous Sequential Logic: Sequential Circuits - Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment Design Procedure.

### **UNIT IV DIGITAL COMPONENTS 9**

Registers and Counters: Registers, Shift Registers, Ripple Counters, Synchronous Counters, Ring Counters-Johnson Counter.

### **UNIT V CIRCUIT DESIGN 9**

Asynchronous Sequential Circuit : Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of State and Flow Tables, Race – Free State Assignment Hazards, Design Example.

**Total No.of.Periods: 45**

**REFERENCES :**

- 1 M.Morris Mano, “Digital Design”, 3rd edition, Pearson Education, Delhi, 2007.
- 2 Donald P Leech, Albert Paul Malvino and Goutam Saha, “Digital Principles and Applications”, Tata Mc Graw Hill, 2007.

**BC1103 - PROGRAMMING IN C**

**L T P C**  
**3 0 0 3**

**UNIT I INTRODUCTION TO C LANGUAGE 9**

Overview of ‘C’ language – Constants, Variables and Data Types – Operators, Expressions and Assignment statements – Managing Input/Output Operations – Formatted I/O – Decision Making -Branching – IF, Nested IF – Switch – go to - Looping- While, do, for statements.

**UNIT II ARRAYS AND FUNCTIONS 9**

Arrays – dynamic and multi-dimensional arrays - Character arrays and Strings – String handling Functions - User defined Functions – Categories of Functions – Recursion.

**UNIT III STRUCTURES AND UNIONS 9**

Basics of Structures-Declaring a Structure – Array of Structures –Passing Structures elements to Functions- Passing entire Structure to Function – Structures within Structures - Union – Union of Structures – Enumerated Data Types – type of Statement.

**UNIT IV POINTERS 9**

Pointers – Declaration, Accessing a variable, dynamic memory allocation, Pointers versus Arrays, Array of pointers, Pointers to functions and structure Pointers.

**UNIT V FILE MANAGEMENT 9**

File Management in C – Data hierarchy- Files and Streams – Sequential access file- Random access file – Pre-processors.

**Total No .of.Periods: 45**

**REFERENCES :**

- 1 V.Rajaraman “Computer Programming in C” PHI, New Delhi, 2001
- 2 Kamthane, A.N., “Programming with ANSI and Turbo C”, Pearson Education, Delhi, 2006.
- 3 Yashavant P. Kanetkar “ Pointers In C” , BPB Publications, New Delhi, 2002
- 4 E.Balagurusamy “ Programming in ANSI C ” , Tata McGraw Hill, 2004

**BC1121- DIGITAL LABORATORY**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>3</b>	<b>1</b>

- 1 . Binary and BCD counter
- 2 . Verification of NAND, NOR, XOR, AND, OR Gate Logic
3. Parity Generator
- 4 . Multiplexer / De multiplexers
5. Adder / Subtractor
6. Code Converters
7. Up / Down 4 bit Binary Counter
- 8 . Up / Down 4 bit Decimal Counter
- 9 . Shift Register
- 10 . Ring Counter

**Total No.of.Periods: 45**

**BC1122-COMPUTER CONCEPTS AND PROBLEM SOLVING LABORATORY**

**L T P C**  
**0 0 3 1**

1. Word Processing
2. Spreadsheet
3. Power point
4. Factorial
5. Fibonacci
6. Prime Generation
7. Removal of duplicates from an ordered Array
8. Finding the  $k^{\text{th}}$  smallest element.

**Total No.of.Periods: 45**

**BC1123-C PROGRAMMING LABORATORY**

**L T P C**  
**0 0 3 1**

1 Input / output function

2 Control Functions

3 Functions

4 Arrays

5 Pointers

6 Structures and Unions

7 Files

Using case studies on: Roots of a quadratic equation, Measures of location – Matrix Operations – Evaluation of trigonometric functions – Pay roll problems. String operations like substring,

concatenation, finding a string from a given paragraph, finding the number of words in a paragraph.

**Total No.of.Periods: 45**

**SEMESTER - II**

**EL1106 - ENGLISH – II**  
(Common to all undergraduate branches)

**L T P C**

**4 0 0 4**

**UNIT I: LISTENING SKILL**

**12**

Listening to long dialogues, extended conversations, discussions, soliloquies -- Listening to modern prose & poetry -- Listening to sounds and stressed syllables in English -- Listening to feature films – Listening to presentations – multiple-choice questions – Listening to interviews – Listening to technical topics -- Listening for the gist of the text -- Listening for general meaning and specific information -- Listening for identifying a topic -- Listening for filling the gaps -- Listening for advanced interpretation.

**UNIT II: SPEAKING SKILL**

**12**

Speaking casually to an individual, a small group, a large audience – Addressing a gathering formally -- Speaking to speculate, compare, contrast, justify, agree and disagree on advanced topics – Talking about present and past experiences and future plans – Debates, discussions and

role plays on advanced topics – Job interviews – Preparing HR questions with possible answers -  
- Brief presentations – Arguing out a topic without verbal fights -- Power point presentation  
based on current topics.

### **UNIT III: READING SKILL**

**12**

Reading for advanced skimming and scanning -- Reading for the gist of a text – Reading for specific information – Reading for understanding the text structure, sentence structure and error identification – Reading for contextual meaning -- Reading newspapers, magazine articles and critical texts – Reading advanced short stories, poems and prose passages for intellectual and emotional comments -- Reading short texts for identifying unnecessary words. – Reading exercises for multiple-choice questions.

### **UNIT IV: WRITING SKILL**

**12**

Writing Instructions, recommendations, functional checklists – Writing the minutes of a meeting – Writing formal business letters – sales, placing orders, complaints -- Letter requesting permission for industrial visits or implant training, enclosing an introduction to the educational institution -- Letters of application for a job, enclosing a CV or Resume -- Writing short reports - - describing, summarizing -- Industrial accident reports -- Writing short proposals -- describing, summarizing, recommending, persuading.

### **UNIT V: THINKING SKILL**

**12**

Imparting the knowledge of English using thinking blocks – Conversion of thinking blocks into orthographic version -- Interpretation and acquisition of English -- Decoding diagrams and pictorial representations into English idioms, sayings and proverbs.

**Total No .of.Periods:60**

### **REFERENCES :**

1. Norman Whitby. *Business Benchmark: Pre-Intermediate to Intermediate* – BEC Preliminary. New Delhi: Cambridge University Press, 2008.
2. Devaki Reddy & Shreesh Chaudhary. *Technical English*. New Delhi: Macmillan, 2009.
3. Rutherford, Andrea J. *Basic Communication Skills for Technology*. 2<sup>nd</sup> edition. New Delhi: Pearson Education, 2010.

**MA1105 - APPLIED MATHEMATICS - II**

**L T P C**  
**4 1 0 4**

**UNIT I                      MULTIPLE INTEGRALS**

**12**

Double integration- Cartesian and polar co-ordinates- Change of order of integration- Area as a double integral, Change of variables between Cartesian and polar co- ordinates- Triple integration- Volume as a triple integral

**UNIT II                      FOURIER SERIES**

**12**

Dirichlet's condition-General Fourier series-Odd and even functions-Half range Fourier series- Parseval's identity-Harmonic analysis



**UNIT III COMPLEX DIFFERENTIATION****12**

Functions of complex variable-analytic function-Necessary Condition-Cauchy Riemann equation-Sufficient conditions (excluding proof) -Properties of analytic functions- Harmonic conjugate-Construction of analytic functions – Conformal Mapping -  $w=z+a$ ,  $w=az$ ,  $w=1/z$ ,  $w=z^2$ - Bilinear transformation.

**UNIT IV COMPLEX INTEGRATION****12**

Statement and applications of Cauchy's Integral theorem and formula-Taylor's and Laurent's expansions- Isolated singularities- Residues-Cauchy's residue theorem- Contour integration over unit circle and semi circular contour (excluding poles on boundaries)

**UNIT V LAPLACE TRANSFORM****12**

Laplace Transforms-Condition for existence-Transforms of Elementary functions- Basic properties-Derivatives and integrals of transforms- Transforms of derivatives and integrals – Initial and Final value theorem- Transform of unit step functions and impulse function- Transform of Periodic function-Inverse Laplace transform- Convolution theorem- Solution of linear ODE of second order with constant co- efficient, using Laplace transformation

**Total No.of Periods: 60****REFERENCES:**

- 1 Kandasamy. P, Thilagavathy K and Gunavathy K, Engineering Mathematics for First year B.E/B.Tech, S.Chand and company Ltd, New Delhi-110055, Seventh Revised edition 2007
- 2 Veerarajan T , Engineering Mathematics (for First year) Tata Mc Graw Hill Publishing co. New Delhi 110008 (2008)
- 3 Grewal B.S, Higher Engineering Mathematics 38th edition, Khanna Publishers New Delhi (2004)

**BC1201- DATA STRUCTURES****L T P C  
3 0 0 3**

<b>UNIT I</b>	<b>PROBLEM SOLVING</b>	<b>9</b>
Problem solving – Top-down Design– Implementation– Verification– Efficiency–Analysis – Sample algorithms.		
<b>UNIT II</b>	<b>LISTS, STACKS AND QUEUES</b>	<b>9</b>
Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT		
<b>UNIT III</b>	<b>TREES</b>	<b>9</b>
Preliminaries – Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Hashing – General Idea – Hash Function – Separate Chaining – Open addressing – Linear Probing – Priority Queues (Heaps) – Model – Simple implementations – Binary Heap		
<b>UNIT IV</b>	<b>SORTING</b>	<b>9</b>
Preliminaries– Insertion Sort – Shells sort –Heap sort– Merge sort–Quick sort– External Sorting		
<b>UNIT V</b>	<b>GRAPHS</b>	<b>9</b>
Definitions– Topological Sort– Shortest-Path Algorithms–Un weighted Shortest Paths– Dijkstra’s Algorithm– Minimum Spanning Tree– Prim’s Algorithm– Applications of Depth-First Search–Undirected Graphs –Bi connectivity– Introduction to NP-Completeness		

**Total No. of periods : 45**

**REFERENCES:**

- 1 R. G. Dromey, “How to Solve it by Computer” (Chaps 1-2), Prentice-Hall of India, 2002.
- 2 M. Allen Weiss, “Data Structures and Algorithm Analysis in C”, 2nd edition, Pearson Education Asia, 2002.
- 3 ISRD Group, “Data Structures using C”, Tata McGraw Hill, 2007
- 4 Richard F. Gilberg, Behrouz A. Forouzan, “Data Structures – A Pseudocode Approach with C”, Thomson Brooks / COLE, 1998.

**UNIT I INTRODUCTION TO 8085 MICROPROCESSOR 9**

8085 Microprocessor: The 8085 MPU– Architecture – Instruction formats – Addressing modes – Instruction set – Programming with 8085 – 8085 based microcomputer system.

**UNIT II INTRODUCTION TO 8086 MICROPROCESSOR 9**

8086 Software Aspects: Intel 8086 Microprocessor – Architecture – Assembly Language Programming – Linking and relocation – Stacks – Procedures – Macros - Interrupts and Interrupt Routines – Byte & String Manipulation

**UNIT III 8086 SYSTEM DESIGN 9**

8086 System Design:8086 signals – Basic configurations – System bus timing – system design using 8086 – Multiprocessor configurations – Coprocessor, Closely coupled and loosely coupled configurations.

**UNIT IV 8086 MICROPROCESSOR INTERFACING 9**

I/O Interfaces: Serial Communication Interface – Parallel communication interface – Programmable Timer – Keyboard and Display controller – DMA controller – Interrupt controller – Maximum Mode and 16-bit bus interface designs.

**UNIT V ADVANCED PROCESSORS 9**

Advanced Processors: Intel’s 80X 86 families of processors – Salient features of 80286, 80386, 80486 and the Pentium Processors.

**Total No.of periods: 45**

**REFERENCES:**

- 1 Ramesh S.Gaonkar, “Microprocessor Architecture, Programming and Applications with the 8085”, 4th Edition, Penram International Publishing (India) Pvt. Ltd., 1999.
- 2 Douglas v. Hall, “Microprocessors and Interfacing”, Tata Mcgraw Hill, 1999.
- 3 Yu-cheng liu and Glenn a. Gibson, “Microcomputer Systems: The 8086/8088 Family Architecture, Programming & Design”, 2nd Edition, Prentice Hall of India Pvt. Ltd., 2001.
- 4 Barry b.Brey, “The Intel Microprocessors – 8086/8088, 80186, 286, 386, 486, Pentium and Pentium Pro Processor”, Prentice Hall of India Pvt. Ltd., 1998.

## **BC 1203-INTRODUCTION TO ACCOUNTING**

**L T P C**  
**4 1 0 3**

**UNIT I** **9**  
Commerce definition – Elements – Form of business – Sole Proprietor – Partnership – company – Private and Public – Public sector: Features and merits.

**UNIT II** **9**  
Introduction to Marketing Definition, nature, scope and importance of marketing, Approaches to the study of marketing and economic development, traditional and modern concept of marketing, Function of marketing.

**UNIT III** **9**  
Fundamentals of Bookkeeping – Accounting Concepts and Conventions – Journal – Ledger – Subsidiary books – Trail balance – Preparation of bank reconciliation statement – Errors and their rectification.

**UNIT IV** **9**  
Bills of Exchange: Accommodation bills – Account Current – Average due date.

**UNIT V** **9**  
Final Accounts: Opening, Closing and Adjustment entries – Manufacturing, Trading and Profit and Loss Accounts – Balance Sheet, Accounts of non-profit organizations- receipts and payments and income and expenditure accounts and balance sheet; Accounts of professionals.

**Total No.of periods: 45**

### **REFERENCES :**

- 1 Jain and Nearing, "Advanced Accounting", Kalia Publishers
- 2 Gupta R L and Radhaswamy M, "Advanced Accountancy", Sultan Chand
- 3 Tulsian P C, "Financial Accounting", Tata Mc. Graw Hill Publications
- 4 Bhushan Y K, "Business Organisation", S.Chand & Co.

## BC1221-DATA STRUCTURES LABORATORY

L T P C  
0 0 3 1

### LIST OF EXERCISES

#### Implement the following exercises using C:

1. Array implementation of List Abstract Data Type (ADT)
2. Linked list implementation of List ADT
3. Cursor implementation of List ADT
4. Array implementations of Stack ADT
5. Linked list implementations of Stack ADT

The following three exercises are to be done by implementing the following source files

- (a) Program for 'Balanced Parenthesis'
- (b) Array implementation of Stack ADT
- (c) Linked list implementation of Stack ADT
- (d) Program for 'Evaluating Postfix Expressions'

An appropriate header file for the Stack ADT should be #included in (a) and (d)

6. Implement the application for checking 'Balanced Parenthesis' using array implementation of Stack ADT (by implementing files (a) and (b) given above)
7. Implement the application for checking 'Balanced Parenthesis' using linked list implementation of Stack ADT (by using file (a) from experiment 6 and implementing file (c))
8. Implement the application for 'Evaluating Postfix Expressions' using array and linked list implementations of Stack ADT (by implementing file (d) and using file (b), and then by using files (d) and (c))
9. Queues ADT
10. Search Tree ADT - Binary Search Tree

**Total No.of periods: 45**

**BC1222-MICROPROCESSORS LAB**

**L T P C**  
**0 0 3 1**

1. Fundamentals of 8085 Programming
2. Fundamentals of 8086 Programming
3. Interfacing with Input/output Devices
4. Parallel peripheral Input/output – Timer – Keyboard Controller – Display
5. Controller – Interrupt Controller, Communication Input/output.

**Total No.of periods: 45**

## **BC1223-ACCOUNTING LABORATORY**

**L T P C**  
**0 0 3 1**

### **THEORY**

Accounting – Introduction, Features, Objectives -Configuration, Chart of Accounts - Accounting Package – Concepts of Double Entry System – (15) Concepts of preparing Final Accounts

### **LIST OF EXERCISES**

1. Company Creation, preparation of groups
2. Preparation of ledgers
3. Preparation of Voucher
4. Preparation of Profit and Loss Account
5. Preparations of Final Accounts with and without Adjustments
6. Cash Flow and Fund Flow Analysis
7. Preparation of Ratio Analysis
8. Stock Transactions
9. F11 – Features and F12 – Configurations
10. Other Features and Report Generation

**Total No.of periods: 45**

## **SEMESTER-III**

### **MA1203 - APPLIED MATHEMATICS III**

**L T P C**  
**4 1 0 4**

#### **UNIT I                      PARTIAL DIFFERENTIAL EQUATIONS                      12**

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Solution of standard types of first order partial differential equations – Lagrange's linear equation – Linear partial differential equations of second and higher order with constant coefficients.

#### **UNIT II                      FOURIER SERIES                      12**

Dirichlet's conditions – General Fourier series – Odd and even functions – Half range sine series– Half range cosine series – Complex form of Fourier Series – Parseval's identify – Harmonic Analysis.

#### **UNIT III                      BOUNDARY VALUE PROBLEMS                      12**

Classification of second order quasi linear partial differential equations – Solutions of one dimensional wave equation – One dimensional heat equation – Steady state solution of two dimensional heat equation (Insulated edges excluded) – Fourier series solutions in Cartesian coordinates.

#### **UNIT IV                      FOURIER TRANSFORM                      12**

Fourier integral theorem (without proof) – Fourier transform pair – Sine and Cosine transforms – Properties – Transforms of simple functions – Convolution theorem – Parseval's identity.

#### **UNIT V                      Z -TRANSFORM AND DIFFERENCE EQUATIONS                      12**

Z-transform - Elementary properties – Inverse Z – transform – Convolution theorem -Formation



**REFERENCES :**

1. Grewal, B.S., “Higher Engineering Mathematics”, Thirty Sixth Edition, Khanna Publishers, Delhi, 2001.
2. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., “Engineering Mathematics Volume III”, S. Chand & Company Ltd., New Delhi, 1996.
3. Wylie C. Ray and Barrett Louis, C., “Advanced Engineering Mathematics”, Sixth Edition, McGraw-Hill, Inc., New York, 1995.
4. Narayanan, S., Manicavachagom Pillay, T.K. and Ramaniah, G., “Advanced Mathematics for Engineering Students”, Volumes II and III, S. Viswanathan (Printers and Publishers) Pvt. Ltd. Chennai, 2002.

**BC1301-ALGORITHM DESIGN TECHNIQUES**

**L T P C**  
**3 0 0 3**

<b>UNIT I</b>	<b>INTRODUCTION</b>	<b>9</b>
Introduction – Notion of Algorithm - Fundamentals of algorithmic problem solving – Important problem types – Fundamentals of the analysis of algorithm efficiency – analysis frame work – Asymptotic notations – Mathematical analysis for recursive and non-recursive algorithms.		
<b>UNIT II</b>	<b>DIVIDE AND CONQUER METHOD AND GREEDY METHOD</b>	<b>9</b>
Divide and conquer methodology – Merge sort – Quick sort – Binary search – Binary tree traversal – Multiplication of large integers – Strassen’s matrix multiplication – Greedy method – Prim’s algorithm – Kruskal’s algorithm – Dijkstra’s algorithm.		
<b>UNIT III</b>	<b>DYNAMIC PROGRAMMING</b>	<b>9</b>
Computing a binomial coefficient– Warshall’s and Floyd’ algorithm – Optimal binary search tree Knapsack problem – Memory functions.		
<b>UNIT IV</b>	<b>BACKTRACKING AND BRANCH AND BOUND</b>	<b>9</b>
Backtracking – N-Queens problem – Hamiltonian circuit problem – Subset sum problem – Branch and bound – Assignment problem – Knapsack problem – Travelling salesman problem.		
<b>UNIT V</b>	<b>NP-HARD AND NP-COMPLETE PROBLEMS</b>	<b>9</b>
P & NP problems–NP-complete problems –Approximation algorithms for NP-hard problems – Travelling salesman problem – Knapsack problem.		

**REFERENCES :**

1. Anany Levitin “Introduction to the Design and Analysis of Algorithms” Pearson Education 2003.
2. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, “Introduction to algorithms” Prentice Hall 1990.
3. SaraBaase and Allen Van Gelder, “Computer Algorithms – Introduction to Design and Analysis” Pearson education, 2003.
4. A.V.Aho, J.E Hopenfit and J.D.Ullman, “The Design and Analysis of Computer algorithms” Pearson education Asia, 2003.

**BC1302 - SOFTWARE ENGINEERING**

**L T P C**  
**4 0 0 4**

**UNIT I SOFTWARE PROCESS 9**

Introduction –S/W Engineering Paradigm – life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) - system engineering – computer based system – verification – validation – life cycle process – development process –system engineering hierarchy.

**UNIT II SOFTWARE REQUIREMENTS 9**

Functional and non-functional - user – system –requirement engineering process – feasibility studies – requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping - S/W document. Analysis and modelling – data, functional and behavioural models – structured analysis and data dictionary.

**UNIT III DESIGN CONCEPTS AND PRINCIPLES 9**

Design process and concepts – modular design – design heuristic – design model and document. Architectural design – software architecture – data design – architectural design – transform and transaction mapping – user interface design – user interface design principles. Real time systems - Real time software design – system design – real time executives – data acquisition system -

monitoring and control system. SCM – Need for SCM – Version control – Introduction to SCM process – Software configuration items.

**UNIT IV TESTING 9**

Taxonomy of software testing – levels – test activities – types of s/w test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies – strategic approach and issues - unit testing – integration testing – validation testing – system testing and debugging.

**UNIT V SOFTWARE PROJECT MANAGEMENT 9**

Measures and measurements – S/W complexity and science measure – size measure – data and logic structure measure – information flow measure. Software cost estimation – function point models – COCOMO model- Delphi method.- Defining a Task Network – Scheduling – Earned Value Analysis – Error Tracking - Software changes – program evolution dynamics – software maintenance – Architectural evolution. Taxonomy of CASE tools.

**Total No .of.Periods : 45**

**REFERENCES :**

1. Roger S.Pressman, Software engineering- A practitioner’s Approach, McGraw-Hill International Edition, 6th edition, 2004.
2. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
3. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
4. James F Peters and Witold Pedryez, “Software Engineering – An Engineering Approach”, John Wiley and Sons, New Delhi, 2000.

**BC1303 - OBJECT ORIENTED PROGRAMMING**

**L T P C  
4 1 0 4**

**UNIT I INTRODUCTION 9**

Object-oriented paradigm, elements of object oriented programming – Merits and demerits of OO methodology – C++ fundamentals – data types, operators and expressions, control flow, arrays, strings, pointers and functions.

**UNIT II PROGRAMMING IN C++ 9**

Classes and objects – constructors and destructors, operator overloading – inheritance, virtual functions and polymorphism

**UNIT III FILE HANDLING 9**

C++ streams – console streams – console stream classes-formatted and unformatted console I/O operations, manipulators - File streams - classes file modes file pointers and manipulations file I/O – Exception handling



**UNIT III BASIC PROCESSING UNIT 9**

Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

**UNIT IV MEMORY SYSTEM 9**

Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.

**UNIT V I/O ORGANIZATION 9**

Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).

**Total No .of. Periods: 45**

**REFERENCES:**

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5th Edition “Computer Organization”, McGraw-Hill, 2002.
2. William Stallings, “Computer Organization and Architecture – Designing for Performance”, 6th Edition, Pearson Education, 2003.
3. David A.Patterson and John L.Hennessy, “Computer Organization and Design: The hardware / software interface”, 2nd Edition, Morgan Kaufmann, 2002.
4. John P.Hayes, “Computer Architecture and Organization”, 3rd Edition, McGraw Hill, 1998.

**BC1321 - OBJECT ORIENTED PROGRAMMING LABORATORY**

**L T P C  
0 0 3 1**

**EXPERIMENTS C++**

1. Programs Using Functions
  - Functions with default arguments
  - Implementation of Call by Value, Call by Address and Call by Reference
2. Simple Classes for understanding objects, member functions and Constructors
  - Classes with primitive data members
  - Classes with arrays as data members

- Classes with pointers as data members – String Class
  - Classes with constant data members
  - Classes with static member functions
3. Compile time Polymorphism
    - Operator Overloading including Unary and Binary Operators.
    - Function Overloading
  4. Runtime Polymorphism
    - Inheritance
    - Virtual functions
    - Virtual Base Classes
    - Templates
  5. File Handling
    - Sequential access
    - Random access

## **JAVA**

6. Simple Java applications
  - for understanding reference to an instance of a class (object), methods
  - Handling Strings in Java
7. Simple Package creation.
  - Developing user defined packages in Java
8. Interfaces
  - Developing user-defined interfaces and implementation
  - Use of predefined interfaces
9. Threading
  - Creation of thread in Java applications
  - Multithreading
10. Exception Handling Mechanism in Java
  - Handling pre-defined exceptions
  - Handling user-defined exceptions

**Total No .of.Periods: 45**

## **BC1322 - ALGORITHMS DESIGN LABORATORY**

**L T P C**  
**0 0 3 1**

1. Apply the divide and Conquer technique to arrange a set of numbers using merge sort method.
2. Perform Stassen's matrix multiplication using divide and conquer method.
3. Solve the knapsack problem using greedy method.

4. Construct a minimum spanning tree using greedy method.
5. Construct optimal binary search trees using dynamic programming method of problem solving.
6. Find the solution for travelling salesperson problem using dynamic programming approach.
7. Perform graph traversals.
8. Implement the 8-Queens Problem using backtracking.
9. Implement knapsack problem using backtracking.
10. Find the solution of travelling salesperson problem using backtracking

**Total No .of. Periods : 45**

Creation of a Database and performing the operations given below using a Menu Driven Program.

a) Insertion b) Deletion c) Modification d) Generating a Simple report for the following:

1. Payroll
2. Mark sheet Processing
3. Saving Bank account for banking
4. Inventory System
5. Library information system
6. Student information system
7. Electricity bill preparation system
8. Telephone directory maintenance.

**Total No. of Periods:45**



## **BC1423- COMPUTER GRAPHICS LABORATORY**

**L T P C**  
**0 0 3 1**

1. Line drawing algorithms
2. Circle drawing algorithms
3. Eclipse drawing algorithms
4. Two dimensional transformations
5. Windowing and clipping
6. Three dimensional transformations
7. Simple animation

**Total No .of.Periods: 45**

## SEMESTER V

### BC1501 - MULTIMEDIA SYSTEMS

**L T P C**  
**3 0 0 3**

<b>UNIT I</b>	<b>INTRODUCTION TO MULTIMEDIA</b>	<b>9</b>
Introduction to making Multimedia- Multimedia Skills and training- Text: Using text in Multimedia-Computer and Text- Font Editing and Design Tools- Hypermedia and Hypertext		
<b>UNIT II</b>	<b>MULTIMEDIA FILE HANDLING</b>	<b>9</b>
Sound – Images – Animation – Video		
<b>UNIT III</b>	<b>DIGITAL VIDEO AND IMAGE COMPRESSION</b>	<b>9</b>
Evaluating a compression system – Redundancy and visibility-Video compression techniques- Standardization of an algorithm – The JPEG image compression standard-ITU –T Standards – MPEG motion video compression standard-DVI Technology.		
<b>UNIT IV</b>	<b>HARDWARE, SOFTWARE AND MULTIMEDIA AUTHORIZING TOOLS</b>	<b>9</b>
Multimedia Hardware: Macintosh and Windows production platforms-Hardware Peripherals: Memory and Storage Devices, Input Devices, Output Devices, Communication Devices .Basic Software Tools		
<b>UNIT V</b>	<b>MULTIMEDIA AND INTERNET</b>	<b>9</b>
Internetworking –connections –Internet services –Tools for WWW – Designing WWW.		

**Total No .of.Periods :45**

#### **REFERENCES :**

1. Multimedia: Making It Work, Tay Vaughan, 7th Edition, Tata Mc-Graw Hill.(Unit I, II, IV and V), 2008.
2. Multimedia Systems, John F.Koegel Buford, Pearson edition, 2003. (unit III).
3. Ranjan Parekh, Principles of Multimedia, TMH, 2006.
4. Multimedia: Computing, Communication and applications, Ralf Steinmetz and Klara Nahrstedt, Pearson Edition, 2001.



## **BC1503 - COMPILER DESIGN**

**L T P C**  
**3 1 0 4**

<b>UNIT I</b>	<b>INTRODUCTION TO COMPILING</b>	<b>9</b>
Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens.		
<b>UNIT II</b>	<b>SYNTAX ANALYSIS</b>	<b>9</b>
Role of the parser –Writing Grammars –Context-Free Grammars – Top Down parsing – recursive Descent Parsing – Predictive Parsing – Bottom-up parsing – Shift Reduce Parsing – Operator Precedent Parsing – LR Parsers – SLR Parser – Canonical LR Parser – LALR Parser.		
<b>UNIT III</b>	<b>INTERMEDIATE CODE GENERATION</b>	<b>9</b>
Intermediate languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – Procedure calls.		
<b>UNIT IV</b>	<b>CODE GENERATION</b>	<b>9</b>
Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization.		
<b>UNIT V</b>	<b>CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS</b>	<b>9</b>
Introduction– Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.		

**Total No .of.Periods : 45**

### **REFERENCES**

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, “Compilers Principles, Techniques and Tools”, Pearson Education Asia, 2003.
2. Allen I. Holub “Compiler Design in C”, Prentice Hall of India, 2003.
3. C. N. Fischer and R. J. LeBlanc, “Crafting a compiler with C”, Benjamin Cummings,2003.
4. J.P. Bennet, “Introduction to Compiler Techniques”, Second Edition, Tata McGraw-Hill, 2003.

## **BC1521 - MULTIMEDIA SYSTEMS LAB**

**L T P C**  
**0 0 3 1**

1. Create a simple painting program using Flash or equivalent.
2. Create a simple animated banner using Flash or equivalent.
3. Design an object dragging program.
4. Prepare a photo album using Flash or equivalent.
5. Create animated buttons which is used for web design using the required software.
6. Design image mapping using Flash or equivalent.
7. Create image morphing using the required software.
8. Make animations using macromedia Flash or equivalent.
9. Create animated Gifs for use as banners, titles and buttons.
10. Create short film in Flash or equivalent using any theme.
11. To perform animation using any animation software.
12. To perform image editing using basic tool, masking effect and rendering effects using any animation software

**Total No .of.Periods: 45**

## **BC1522 - INTERNET PROGRAMMING LAB**

**L T P C**  
**0 0 3 1**

### **LIST OF EXPERIMENTS**

1. Write programs in Java to demonstrate the use of following components Text fields, buttons, Scrollbar, Choice, List and Check box
2. Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout
3. Write programs in Java to create applets incorporating the following features:
  - a) Create a color palette with matrix of buttons
  - b) Set background and foreground of the control text area by selecting a color from color palette.
  - c) In order to select Foreground or background use check box control as radio buttons
  - d) To set background images
4. Write programs in Java to do the following.
  - a) Set the URL of another server.
  - b) Download the homepage of the server.
  - c) Display the contents of home page with date, content type, and Expiration date. Last modified and length of the home page.
5. Write programs in Java using sockets to implement the following:
  - a) HTTP request
  - b) FTP
  - c) SMTP
  - d) POP3
6. Write a program in Java for creating simple chat application with datagram sockets and Data gram packets.

7. Write programs in Java using Servlets:
  - a) To invoke servlets from HTML forms
  - b) To invoke servlets from Applets
8. Write programs in Java to create three-tier applications using servlets
  - a) To conduct an on-line examination.
  - b) To display student mark list. Assume that student information is available in a database which has been stored in a database server.
9. Create a web page with the following using HTML
  - a) To embed a map in a web page
  - b) To fix the hot spots in that map
  - c) Show all the related information when the hot spots are clicked.
10. Create a web page with the following.
  - a) Cascading style sheets.
  - b) Embedded style sheets.
  - c) Inline style sheets.
  - d) Use your college information for the web pages.

**Total No .of. Periods: 45**

### **BC1523 - COMPILER DESIGN LAB**

**L T P C**  
**0 0 3 1**

1. Implement a lexical analyzer in “C”.
2. Use LEX tool to implement a lexical analyzer.
3. Implement a recursive descent parser for an expression grammar that generates arithmetic expressions with digits, + and \*.
4. Use YACC and LEX to implement a parser for the same grammar as given in problem
5. Write semantic rules to the YACC program in problem 5 and implement a calculator that takes an expression with digits, + and \* and computes and prints its value.
6. Implement the front end of a compiler that generates the three address code for a simple language with: one data type integer, arithmetic operators, relational operators, variable declaration statement, one conditional construct, one iterative construct and assignment statement.
7. Implement the back end of the compiler which takes the three address code generated in problems 7 and 8, and produces the 8086 assembly language instructions that can be assembled and run using a 8086 assembler. The target assembly instructions can be simple move, add, sub, jump. Also simple addressing modes are used.

**SEMESTER VI**

**BC1601 - CRYPTOGRAPHY AND NETWORK SECURITY**

**L T P C**  
**3 0 0 3**

**UNIT I INTRODUCTION 9**

OSI Security Architecture - Classical Encryption techniques – Cipher Principles – Data Encryption Standard – Block Cipher Design Principles and Modes of Operation – Evaluation criteria for AES – AES Cipher – Triple DES – Placement of Encryption Function – Traffic Confidentiality

**UNIT II PUBLIC KEY CRYPTOGRAPHY 9**

Key Management - Diffie-Hellman key Exchange – Elliptic Curve Architecture and Cryptography  
- Introduction to Number Theory – Confidentiality using Symmetric Encryption – Public Key Cryptography and RSA.

**UNIT III AUTHENTICATION AND HASH FUNCTION 9**

Authentication requirements – Authentication functions – Message Authentication Codes – Hash Functions – Security of Hash Functions and MACs – MD5 message Digest algorithm – Secure Hash Algorithm – RIPEMD – HMAC Digital Signatures – Authentication Protocols – Digital Signature Standard



**UNIT IV NETWORK SECURITY 9**  
Authentication Applications: Kerberos – X.509 Authentication Service – Electronic Mail Security –PGP – S/MIME - IP Security – Web Security.

**UNIT V SYSTEM LEVEL SECURITY 9**  
Intrusion detection – password management – Viruses and related Threats – Virus Counter measures – Firewall Design Principles – Trusted Systems.

**Total No .of. Periods: 45**

**REFERENCES**

1. William Stallings, “Cryptography And Network Security – Principles and Practices”,Prentice Hall of India, Third Edition, 2003.
2. Bruce Schneier, “Applied Cryptography”, John Wiley & Sons Inc, 2001.
3. Atul Kahate, “Cryptography and Network Security”, Tata McGraw-Hill, 2003.
4. Charles B. Pfleeger, Shari Lawrence Pfleeger, “Security in Computing”, Third Edition,Pearson Education, 2003.

**BC1602 - DATAWAREHOUSING AND DATA MINING**

**L T P C**  
**3 0 2 4**

**UNIT I INTRODUCTION TO DATA WAREHOUSING 9**  
Introduction, Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Implementation, Further Development, Data Warehousing to Data Mining

**UNIT II DATA PREPROCESSING, LANGUAGE, ARCHITECTURES, CONCEPT DESCRIPTION 9**  
Why Preprocessing, Cleaning, Integration, Transformation, Reduction, Discretization, Concept Hierarchy Generation, Data Mining Primitives, Query Language, Graphical User Interfaces, Architectures, Concept Description, Data Generalization, Characterizations, Class Comparisons, Descriptive Statistical Measures.

**UNIT III ASSOCIATION RULES 9**  
Association Rule Mining, Single-Dimensional Boolean Association Rules from Transactional Databases, Multi-Level Association Rules from Transaction Databases

**UNIT IV CLASSIFICATION AND CLUSTERING 9**

Classification and Prediction, Issues, Decision Tree Induction, Bayesian Classification, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy, Cluster Analysis, Types of data, Categorisation of methods, Partitioning methods, Outlier Analysis.

## **UNIT V RECENT TRENDS**

**9**

Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, World Wide Web, Applications and Trends in Data Mining

**Total No .of. Periods: 45**

## **REFERENCES**

1. J. Han, M. Kamber, “Data Mining: Concepts and Techniques”, Harcourt India / Morgan Kauffman, 2001.
2. Margaret H.Dunham, “Data Mining: Introductory and Advanced Topics”, Pearson Education 2004.
3. Sam Anahory, Dennis Murry, “Data Warehousing in the real world”, Pearson Education 2003.
4. David Hand, Heikki Manila, Padhraic Symth, “Principles of Data Mining”, PHI 2004.
5. W.H.Inmon, “Building the Data Warehouse”, 3rd Edition, Wiley, 2003.
6. Alex Bezon, Stephen J.Smith, “Data Warehousing, Data Mining & OLAP”, McGraw- Hill Edition, 2001.
7. Paulraj Ponniah, “Data Warehousing Fundamentals”, Wiley-Interscience Publication, 2003.

## **BC1621 - WEB APPLICATION LABORATORY**

**L T P C**  
**3 0 0 1**

1. Create a simple page introducing yourself how old you are, what you do, what you like and dislike. Modify the introduction to include a bullet list of what you do and put list the 5 things you like most and dislike as numbered lists. Create another page about your favourite hobby, and link it to (and from) your main page. Centre something, and put a quote on one of your pages
2. Put an existing image on a web page. Create a table, use a heading and at least one use of row span/column span. Colour a page and some text within the page. Link to another site
3. Create a new file called index. html.
  - \* Put the normal HTML document structure tags in the file.
  - \* Give it a title.
  - \* At the bottom of the page (i.e. the last thing between the body tags) put the following:
  - \* A horizontal rule.

- \* A link to your email address (with your name between the tag); remember to put the link to your email address within address tags.
- \* A line break.
- \*The date. (I have this same structure at the bottom of this page).
- \* Above this block (which is called the footer), put a title in heading tags.
- \* Add some text describing yourself (you can split this into multiple headings and paragraphs if you wish

4. Write a script to create an array of 10 elements and display its contents.
5. Write a function in Javascript that takes a string and looks at it character by character.
6. Create a simple calculator using form fields. Have two fields for number entry & one field for the result. Allow the user to be able to use plus, minus, multiply & divide.
7. Create a document and add a link to it. When the user moves the mouse over the link, it should load the linked document on it's own. (User is not required to click on the link).
8. Create a document, which opens a new window without a toolbar, address bar, or a status bar that unloads itself after one minute.
9. Create a document that accepts the user's name in a text field form and displays the same the next time when the user visits the site informing him that he has accessed the site for the second time, and so on.
10. Create a Web form for an online library. This form must be able to accept the Membership Id of the person borrowing a book, the name and ID of the book, and the name of the book's author. On submitting the form, the user (the person borrowing the book) must be thanked and informed of the date when the book is to be returned, You can enhance the look of the page by using various ASPNET controls.
11. Display an advertisement at the bottom of the Web form that you created in question 10.
12. Create an array containing the titles of five new movies. Use this array as a data source for a drop down list control. The page must be capable of displaying the selected movie title to the user when the user clicks on the submit button.
13. Create a virtual directory in uS. Create a global.asax file and include the 'Session\_Start' and 'Session\_End' and, 'Application\_BeginRequest' and 'Application\_EndRequest' events. Write a simple ASP.NET page and execute it in the browser.



**SPECIALIZATION ON DATABASE MANAGEMENT SYSTEM**

<b>Code no</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>TCH</b>
<b>SEMESTER V</b>						
BC1615	Distributed Database Systems	3	0	0	3	3
BC1616	Advanced Data Warehousing	3	0	0	3	3
<b>SEMESTER VI</b>						
BC1617	Advanced Databases	3	0	0	3	3
BC1618	Advanced Data Mining	3	0	0	3	3
BC1619	Database Engineering	3	0	0	3	3
	<b>TOTAL</b>				15	15

**BC1615 - DISTRIBUTED DATABASE SYSTEMS**

**L T P C**

**UNIT 1      OVERVIEW OF RELATIONAL DBMS      9**

Relational Database Concepts, Normalization, Relational Data Languages, Review of Computer Networks: Types of Networks, Communication Schemes, Data Communication Concepts, Communication Protocols.

**UNIT II      DISTRIBUTED DATABASE DESIGN      9**

Top-Down Design Process, Distribution Design Issues, Reasons for Fragmentation, Fragmentation Alternatives, Degree of Fragmentation, Correctness Rules of Fragmentation, Allocation Alternatives , Information Requirements, Fragmentation, Horizontal Fragmentation, Vertical Fragmentation, Hybrid Fragmentation, Allocation , Allocation Problem , Information Requirement, Allocation Model , Solution Methods , Data Directory .

**UNIT III      DATA AND ACCESS CONTROL      9**

View Management , Views in Centralized DBMSs , Views in Distributed DBMSs , Maintenance of Materialized Views, Data Security Discretionary Access Control, Multilevel Access Control, Distributed Access Control, Semantic Integrity Control, Centralized Semantic Integrity Control, Distributed Semantic Integrity Control ,

**UNIT IV      OVERVIEW OF QUERY PROCESSING      9**

Query Processing Problem, Objectives of Query Processing, Complexity of Relational Algebra Operations, Characterization of Query Processors, Languages , Types of Optimization, Optimization Timing, Statistics, Decision Sites, Exploitation of the Network Topology, Exploitation of Replicated Fragments, Use of Semi joins , Layers of Query Processing, Query Decomposition, Data Localization, Global Query Optimization, Distributed Query Execution.

**UNIT V      QUERY DECOMPOSITION AND DATA LOCALIZATION      9**

Query Decomposition, Normalization, Analysis, Elimination of Redundancy, Rewriting, Localization of Distributed Data. Reduction for Primary Horizontal Fragmentation, Reduction for Vertical Fragmentation, Reduction for Derived Fragmentation, Reduction for Hybrid Fragmentation

**Total Periods: 45**

**REFERENCES:**

1. “Principles of Distributed Database Systems” by M. Tamer Ozsu, Springer 3<sup>rd</sup> Edition
2. “Distributed Database Management system” by Saeed K. Rahimi, Frank S. Haug,

**UNIT I DATA WAREHOUSE ENVIRONMENT**

9

The Structure of The Data Warehouse, Subject Orientation, Day 1 to Day n Phenomenon, Granularity, The Benefits of Granularity, An Example of Granularity, Dual Levels of Granularity, Exploration and Data Mining , Living Sample Database, Partitioning as a Design Approach, Partitioning of Data, Structuring Data in the Data Warehouse, Auditing and the Data Warehouse, Data Homogeneity and Heterogeneity, Purging Warehouse Data, Reporting Warehouse Data, The Operational Window of Opportunity, Incorrect Data in the Data Warehouse.

**UNIT II DATAWAREHOUSE AND DESIGN**

9

Beginning with Operational Data, Process and Data Models and the Architected Environment, The Data Warehouse and Data Model, The Data Warehouse Data Model, The Midlevel Data Model, The Physical Data Model, The Data Model and Iterative Development, Normalization and Demoralization, Snapshots in the Data Warehouse, Metadata, Managing Reference Tables in a Data Warehouse, Cyclicity of Data-The Wrinkle of Time, Complexity of Transformation and Integration, Triggering the Data Warehouse Record, Events, Components of the Snapshots, Some Examples, Profile Records, Managing Volume, Creating Multiple Profile Record, Going From the Data Warehouse to the Operational Environment, Direct Operational Access of Data Warehouse Data, An Airline Commission Calculation System, A Retail Personalization System, Credit Scoring, Indirect Use of Data Warehouse Data, Star Joins, Supporting the ODS, Requirements and the Zachman Framework.

**UNIT III DATAWAREHOUSE AND TECHNOLOGY**

9

Managing Large Amounts of Data, Managing Multiple Media, Indexing and Monitoring Data, Interfaces to Many Technologies, Programmer or Designer Control of Data Placement, Parallel Storage and Management of Data, Meta Data Management, Languages Interface, Efficient Loading of Data , Efficient Index Utilization, Compaction of Data, Compound Keys, Variable Length Data, Lock Management, Index-only processing, east restore, other technology features, DBMS types and data warehouse, Changing DBMS Technology, Multidimensional DBMS and Data Warehouse, Data Warehousing across Multiple Storage Media, The Role of Metadata in the Data Warehouse Environment, Context and Contend, Three Types of Contextual Information , Capturing and Managing Contextual Information, Looking at the Past, Refreshing the Data Warehouse.

**UNIT IV DISTRIBUTED DATA WAREHOUSE**

9

Types of Distributed Data Warehouses, Local and Global Data Warehouses, The Local Data Warehouse The Global Data Warehouse, Intersection of Global and Local Data ,Intersection of Global and Local Data Redundancy , Access of Local and Global Data ,The Technologically Distributed Data Warehouse ,The independently Evolving Distributed Data Warehouse ,The Nature of the Development Efforts, Completely Unrelated Warehouses, Distributed Data Warehouse Development ,Coordinating Development across Distributed Locations, The

Corporate Data Modal-Distributed, Metadata in the Distributed warehouse, Building the Warehouse on Multiple Levels ,Multiple Groups Building the Current Level of Detail, Other Types of Detailed Data, Metadata, Multiple Platforms for Common Detail Data.

**UNIT V            EXTERNAL DATA AND DATAWAREHOUSE**

**9**

External Data in the Data Warehouse, Metadata and External Data, Storing External Data Different Components of External ,Modeling and External Data, Secondary Reports, Archiving External Data, Comparing Internal Data to External Data. Supporting the eBusiness Environment, Moving Data from the Web to the Data Warehouse, Moving Data from the Data Warehouse to the Web, Web Support.

**Total Periods: 45**

**References:**

1. “Building the Data Warehouse” ( 4<sup>th</sup> edition) by William . H .Inmon Publised by Wiley
2. “Advanced Data Warehouse Design”, Malinowski, Elzbieta, Zimányi, Esteban, 2008





2. Gary W. Hanson and James V. Hanson, “Database Management and Design”, Prentice Hall of India Pvt Ltd, 1999.

3. Alex Benson, Stephen Smith and Kurt Thearling, “Building Data Mining Applications for CRM”, Tata McGraw-Hill, 2000.

## **BC1618 – ADVANCED DATA MINING**

**L T P C**

**3 0 0 3**

**9**

### **UNIT I INTRODUCTION TO DATA MINING**

What is data mining? , Related technologies - Machine Learning, DBMS, OLAP, Statistics , Data Mining Goals , Stages of the Data Mining Process , Data Mining Techniques , Knowledge Representation Methods , Applications .Data mining knowledge representation Task relevant data , Background knowledge , Interestingness measures , Representing input data and output knowledge , Visualization techniques , Experiments with Weka - visualization , Attribute-oriented analysis , Attribute generalization , Attribute relevance , Class comparison , Statistical measures , Experiments with Weka - using filters and statistics

### **UNIT II DATAMINING ALGORITHMS**

**9**

Association rules, Motivation and terminology , Example: mining weather data , Basic idea: item sets, Generating item sets and rules efficiently, Correlation analysis, Experiments with Weka - mining association rules .Data mining algorithms: Classification , Basic learning/mining tasks, Inferring rudimentary rules: 1R algorithm , Decision trees, Covering rules , Experiments with Weka - decision trees, rules

### **UNIT III EVALUATION**

**9**

Basic issues , Training and testing, Estimating classifier accuracy (holdout, cross-validation, leave-one-out) , Combining multiple models (bagging, boosting, stacking) , Minimum Description Length Principle (MLD) , Mining real data, Preprocessing data from a real medical domain

**UNIT IV CLUSTERING****9**

Basic issues in clustering , First conceptual clustering system: Cluster/2 Partitioning methods: k-means, expectation maximization (EM), Hierarchical methods: distance-based agglomerative and divisible clustering, Conceptual clustering: Cobweb, Experiments with Weka - k-means, EM, Cobweb.

**UNIT V DATAMINING SOFTWARE AND APPLICATIONS****9**

Text mining: extracting attributes (keywords), structural approaches (parsing, soft parsing). Bayesian approach to classifying text Web mining: classifying web pages, extracting knowledge from the web. Data Mining software and applications.

**Total Periods: 45****REFERENCES:**

1. Ian H. Witten and Eibe Frank, Data Mining: Practical Machine Learning Tools and Techniques (Second Edition), Morgan Kaufmann, 2005, ISBN: 0-12-088407-0.

**BC1619- DATABASE ENGINEERING****L T P C****3 0 0 3****9****UNIT I RELATIONAL DATABASES**

Relational Databases: Integrity Constraints revisited: Functional, Multi-valued and Join Dependency, Template Algebraic, Inclusion and Generalized Functional Dependency, Chase Algorithms and Synthesis of Relational Schemes. Query Processing and Optimization: Evaluation of Relational Operations, Transformation of Relational Expressions, Indexing and Query Optimization, Limitations of Relational Data Model, Null Values and Partial Information.

**UNIT II OBJECT ORIENTED DATABASES****9**

Objected Oriented and Object Relational Databases: Modeling Complex Data Semantics, Specialization, Generalization, Aggregation and Association, Objects, Object Identity, Equality and Object Reference, Architecture of Object Oriented and Object Relational Databases. Case Studies: Gemstone, O2, Object Store, SQL3, Oracle xxi, DB2.

**UNIT III ADVANCED TRANSACTION PROCESSING****9**

Advanced Transaction Processing: Nested and Multilevel Transactions, Compensating Transactions and Saga, Long Duration Transactions, Weak Levels of Consistency, Transaction Work Flows, and Transaction Processing Monitors.

**UNIT IV ACTIVE DATABASES**

**9**

Active Databases: Triggers in SQL, Event Constraint and Action: ECA Rules, Query Processing and Concurrency Control, Compensation and Databases Recovery. Real Time Databases: Temporal Constraints: Soft and Hard Constraints, Transaction Scheduling and Concurrency Control.

**UNIT V WEB DATABASES**

**9**

WEB Databases: Accessing Databases through WEB, WEB Servers, XML Databases, and commercial Systems: Oracle xxi, DB2. Data Mining: Knowledge Representation Using Rules, Association and Classification Rules, Sequential Patterns, Algorithms for Rule Accessing.

**Total Periods: 45**

**REFERENCES:**

1. Abraham Silberschatz, Henry Korth, and S. Sudarshan, Database System Concepts, McGrawHill.
2. Raghu Ramakrishnan, Database Management Systems, WCB/McGraw-Hill.
3. Bipin Desai, An Introduction to Database Systems, Galgotia.
4. J. D. Ullman, Principles of Database Systems, Galgotia.
5. R. Elmasri and S. Navathe, Fundamentals of Database Systems8, Addison-Wesley.
6. Serge Abiteboul, Richard Hull and Victor Vianu, Foundations of Databases. Addison-Wesley.

