

**ORDINANCES  
AND OUTLINES OF TESTS,  
SYLLABI AND COURSES OF READING**

**FOR**

**BACHELOR OF COMPUTER APPLICATIONS (B.C.A)**

**(SEMESTER SYSTEM)**

**PART-II**

**(Semester 3rd and 4th)**

**FOR**

**2011-12, 2012-13, 2013-14 SESSIONS**

**PUNJABI UNIVERSITY,  
PATIALA – 147 002**

**ORDINANCES**  
**(FOR B.C.A. UNDER THE +3 SCHEME)**

*Applicability of Ordinances for the time being in force*

Notwithstanding the integrated nature of a course spread over more than one academic year, the ordinances in force at the time a student joins a course shall hold good only for the examination held during or at the end of the academic year. Nothing in these Ordinances shall be deemed to debar the University from amending the ordinances subsequently and the amended ordinances, if any, shall apply to all the students whether old or new.

- 1 B.C.A. is an integrated course comprising three parts spread over three years. Each part will consist of two semesters. The course of study of B.C.A. shall be divided in six semesters and university examination will be held at the end of every semester in the months of November/December (for semester I, III & V) and May/June (for semester II, IV & VI) or as fixed by the Academic Council.
- 2 A candidate must complete and pass the whole course of three years within a maximum of five years from the date of admission in B.C.A. first semester.
- 3 The outlines of tests and syllabi shall be such as prescribed by the Academic Council from time to time.
- 4 A candidate will be eligible to join 1st semester of B.C.A course, if he/she has passed +2 examination of Punjab School Education Board, or any other examination recognised as equivalent thereto without reappear.
- 5 Semester examination will be open to regular candidates who have been on the rolls of a college affiliated to this University and meet the attendance and other requirements as prescribed in the Ordinances No.7
- 6 Subject to fulfilment of requirement of House examinations, the attendance requirements and these ordinances there will be no condition of passing papers for promotion from odd semester to even semester in an Academic Session. To qualify for admission to 2nd year of the Course, the candidate must have passed 50% of total papers of the two semesters of the 1st year. Similarly, to qualify for admission to 3rd year of the course, the candidate should have passed 50% of total papers of four semesters of the earlier two years. A candidate placed under reappear in any paper, will be allowed two chances to clear the reappear, which should be availed within consecutive two years/chances i.e. to pass in a paper the candidate will have a total of three chances, one as regular student and two as reappear candidate. The examination of reappear papers of odd semester will be held with regular examination of the odd semester and reappear examination of the even semester will be held with regular examination of even semester. But if a candidate is placed under reappear in the last semester of the course, he will be provided chance to pass the reappear with the examination of the next semester, provided his reappear of lower semester does not go beyond next semester.
- 7 **Attendance Requirements**  
Every candidate will be required to attend a minimum of 75% lectures delivered to that class in each paper as well as 75% of the laboratory work,

seminars etc. separately. Provided that a deficiency in attendances may be condoned for special reasons, as per the relevant ordinances on the subject.

- 8 To be eligible to appear in the semester examination a candidate must have obtained in the house examination at least 25% marks in each paper; 33% marks in the aggregate of all subjects of the semester. The Principal at his discretion may allow a special test to a candidate who could not appear in the House examination owing to unavoidable reasons or fails to secure the minimum marks as prescribed above.
- 9 **Late College Students:** A candidate who has completed the prescribed course of instructions for a semester but has not appeared in the examination or having appeared, has failed in the examination, may appear as a late college student within the prescribed period.
- 10 The pass and reappear students of B.C.A Part-I and II from Panjab University, Guru Nanak Dev University and Punjab Technical University shall be treated at par with the corresponding students of this University. But in case such a student is admitted in B.C.A semester III or V in this University, he/she will be required to clear deficient papers, if any.
- 11 Amount of examination fee to be paid by a candidate for each semester shall be as fixed by the University from time to time.
- 12 Applications for admission to the examination shall be made on the prescribed form attested by the competent authority as per University rules. The last date by which admission forms and fees must reach the Registrar shall be as follows:

Semester	Without late fee	With late fee of Rs. 500/-	With late fee of Rs. 1000/-	With late fee of Rs. 5000/-	With late fee of Rs. 10000/-
(Nov/Dec)	Sept. 30	Oct. 8	Oct. 16	Oct. 24	Oct. 31*
(May/June)	Feb. 18	Feb. 26	Mar. 06	Mar. 14	Mar. 21*
* No Examination Form will be accepted after this date.					

- 13 University medal will be awarded to a candidate who secured first position in the University on the basis of the marks of all the six semesters taken together. The general rules and conditions of the University for the award of medal/prizes etc. will be applicable in the award of University medal to the topper of this examination.
- 14 The medium of instructions and examination will be English except for the Punjabi papers.
- 15 In each Paper 20% of the total marks are assigned to the internal assessment and 80% marks to the University examination.
- 16 The minimum number of marks required to pass the examination in each Part shall be 35% in each subject, provided that in subject with practical the percentage shall be required separately in written and practical/lab work. The

candidate shall also be entitled to grace marks as admissible under the ordinances relating to the **`GENERAL GRACE MARKS`**.

- 17 The successful candidates shall be classified on the basis of aggregate marks secured in all the six semesters of B. C. A. taken together as under:
- (a) 75% or more with Distinction.
  - (b) 60% or more in the First division.
  - (c) 50% or more but less than 60% in the Second division.
  - (d) below 50% in the Third division.

**OUTLINE OF PAPERS AND TESTS**  
for  
**B.C.A. Second Year – Third Semester**

Code	Title of Paper	Hours per Week	University Examination	Internal Assessment	Max. Marks	Exam. Duration Hours
BCA-211	English Communication Skills – I	4	80	20*	100	3
BCA-212	Discrete Mathematics	4	80	20	100	3
BCA-213	Computer System Organizations and Architecture	4	80	20	100	3
BCA-214	Object Oriented Programming using C++	4	80	20	100	3
BCA-215	Fundamentals of Database Management System	4	80	20	100	3
BCA-216	Software Lab – V (based on paper BCA-214: Object Oriented Programming using C++)	4	40	10	50	3
BCA-217	Software Lab – VI (MS Access Lab based on BCA-215 Fundamentals of Database Management System)	4	40	10	50	3
BCA-218	Environment Studies ( <b>Qualifying Exam</b> )	4			100	3
<b>Total</b>			<b>480</b>	<b>120</b>	<b>600</b>	

**Note:**

1. The break up of marks for the practical will be as under:
  - i. Lab Record (Internal Assessment) 10 Marks
  - ii. Viva Voce (External Evaluation) 20 Marks
  - iii. Program Development and Execution(External Evaluation) 20 Marks
  
2. The break up of marks for the internal assessment for theory papers except BCA-211 will be as under:
  - i. One or two tests out of which minimum one best will be considered for assessment. 15 Marks
  - ii. Attendance, Class participation and behaviour 5 Marks

\*The break up of marks for the internal assessment for BCA-211: English Communication Skills – I will be as under:

- i. Formal assessment through Interview/Self Introduction/Recitation etc. 10 Marks
- ii. Conversation Skills (particularly listening and speaking to be evaluated through oral examination) 5 Marks
- iii. Attendance, Class participation and behaviour 5 Marks

**OUTLINE OF PAPERS AND TESTS**  
for  
**B.C.A. Second Year – Fourth Semester**

Code	Title of Paper	Hours per Week	University Examination	Internal Assessment	Max. Marks	Exam. Duration Hours
BCA-221	English Communication Skills – II	4	80	20*	100	3
BCA-222	Computer Networks	4	80	20	100	3
BCA-223	Management Information Systems	4	80	20	100	3
BCA-224	Computer Oriented Numerical and Statistical Methods	4	80	20	100	3
BCA-225	Relational Database Management Systems with Oracle	4	80	20	100	3
BCA-226	Software Lab – VII (based on paper BCA-224: Computer Oriented Numerical and Statistical Methods)	4	40	10	50	3
BCA-227	Software Lab – VIII (Oracle Lab based on paper BCA-225: Database Management Systems with Oracle )	4	40	10	50	3
<b>Total</b>			<b>480</b>	<b>120</b>	<b>600</b>	

**Note:**

1. The break up of marks for the practical will be as under:
  - i. Lab Record (Internal Assessment) 10 Marks
  - ii. Viva Voce (External Evaluation) 20 Marks
  - iii. Program Development and Execution(External Evaluation) 20 Marks
  
2. The break up of marks for the internal assessment for theory papers except BCA-221 will be as under:
  - i. One or two tests out of which minimum one best will be considered for assessment. 15 Marks
  - ii. Attendance, Class participation and behaviour 5 Marks

\*The break up of marks for the internal assessment for BCA-221: English Communication Skills – II will be as under:

- i. Formal assessment through Interview/Self Introduction/Recitation etc. 10 Marks
- ii. Conversation Skills (particularly listening and speaking to be evaluated through oral examination) 5 Marks
- iii. Attendance, Class participation and behaviour 5 Marks

## BCA-211: English Communication Skills – I

**Max Marks: 80  
Hrs.**

**Maximum Time: 3**

**Min Pass Marks: 35%  
Hrs**

**Lectures to be delivered: 45-55**

**English Communication Skills** has been designed to develop the student's communicative competence in English. Therefore, content selection is determined by the student's present and future academic, social and professional needs.

### **Texts Prescribed for Grammar and Vocabulary:**

W. Standard Allen: Living English Structure (Orient Longman)

Wilford D. Best: The Student's Companion (Rupa)

### **SECTION A: Comprehension Marks**

**25**

One unseen passage with a variety of questions including 05 marks for vocabulary such as word formation and inferring meaning. The total range of the passage including a poem or a stanza, should be around 300-350 words.

15 Marks

One unseen passage 250-300 words in length for note-making and summarizing

10 Marks

The passages could be any one of the types such as **Factual passages** e.g. illustrations, description, reports, **Discursive passages** involving opinion e.g. argumentative, persuasive **Literary passages** e.g. poems, extracts from fiction, biography, autobiography, travelogue etc.

### **SECTION B: Grammar Marks**

**25**

Reordering of words and sentences (Attempt any 5 out of 7)

5 Marks

Composing a dialogue based on the given input (Attempt any 5 out of 7)

5 Marks

Error correction in sentences (Attempt any 5 out of 7)

5 Marks

Drafting questions/questionnaires based on given input (Attempt any 5 out of 7)

5 Marks

Transforming one type of sentence to another type of sentence including change narration, voice, tense etc. (Attempt any 5 out of 7)

5 Marks

### **SECTION C: Composition Marks**

**30**

One out of two short formal notice writing such as public, legal, memorandum etc. (50-80 words) Notice must be written in the box.

5 Marks

One out of two short informal writing tasks such as factual description of people, places and objects, arguing for or against topics, writing pros or cons etc. (50-80 words)

5 Marks

Writing one out of two official letter for making inquiries, suggesting changes, registering complaints, asking and giving information, placing orders and sending replies(80-100 words)

10 Marks

Application for a job including CV (Curriculum Vitae)/Resume

10 Marks

## BCA-212: Discrete Mathematics

**Max Marks: 80  
Hrs.**

**Maximum Time: 3**

**Min Pass Marks: 35%  
Hrs**

**Lectures to be delivered: 45-55**

### (A) INSTRUCTION FOR THE PAPER SETTER

The question paper will consist of four sections A, B, C and D. Section A, B and C will have two questions from the respective section of the syllabus carrying 15 marks for each question. Section D will consist of 8-10 short answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

### (B) INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

#### SECTION-A

**Set Theory:** Sets, Type of sets, Set operations, Principle of Inclusion-Exclusion, Cartesian product of sets, Partitions.

**Logic :** Propositions, Implications, Precedence of logical operators, Translating English sentences into logical expressions, Propositional equivalence

**Principle of Mathematical induction.**

#### SECTION- B

**Relations:** Relations and diagraph, n-ary relations and their applications, properties of relations, representing relations, closure of relation, equivalence relation, operation on relations, partial ordering.

**Functions:** Functions, One-to-one Functions, Onto Functions, Inverse and Composition of Functions, Floor Function, Ceiling Function.

**Basic Concepts (Only Definition):** Big-O Notation, Big-Omega and Big-Theta Notation.

#### SECTION -C

**Graphs:** Introduction to Graph, Graph terminology, Representing graphs and Graph Isomorphism, Connectivity, Euler Paths and Circuits, Hamiltonian paths and circuits, Shortest Path Problems, Planar Graphs.

**Trees :** Trees, labelled trees, Tree Traversal, Undirected trees, Spanning Trees, Minimum spanning trees.

#### Text Book

1. Discrete Mathematical Structures-Bernard Kolman, Robert C. Busby, Sharon C. Ross, 4th Edition, Pearson Education Asia.

#### References :

1. Discrete Mathematics-Richard Johnsonbaugh, 5th Edition, Pearson Education, Asia.
2. Elements of Discrete Mathematics, Second Edition, Tata McGraw Hill.
3. Discrete Mathematics, Seymour Lipschutz & Max Lans Lipson, Tata McGraw Hill.

## **BCA-213: Computer System Organization and Architecture**

**Max Marks: 80  
Hrs.**

**Maximum Time: 3**

**Min Pass Marks: 35%  
Hrs**

**Lectures to be delivered: 45-55**

### **(A) INSTRUCTION FOR THE PAPER SETTER**

The question paper will consist of four sections A, B, C and D. Section A, B and C will have two questions from the respective section of the syllabus carrying 15 marks for each question. Section D will consist of 8-10 short answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

### **(B) INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

#### **SECTION-A**

**Components of a Computer:** Processor, Memory, Input-Output Unit, Historical Computer Architecture: First, Second, Third, Fourth Generation and Beyond, Difference between Organization and Architecture, Hardware Software Interaction.

**Instruction Types:** Three-address, Two-address, One-address, Zero-address; Addressing Modes, Interrupts.

#### **SECTION-B**

**Digital Logic Circuits:** Design of Combinational Circuits: Half Adder, Full Adder.

**Sequential Circuits:** SR, JK, D, T Flip-Flop, Excitation Tables, State Diagram, State Table, Binary Counter

#### **SECTION-C**

**CPU Architecture:** Processor, Register Organisation, ALU, CU, Memory, Input/Output; Instruction Implementation: Instruction Cycle, Fetch-Execute Cycle, Instruction codes, op-codes, Timing and Control, Memory reference instructions.

**Memory:** Hierarchical Memory Structure, RAM, ROM, Cache, Auxiliary Memory

#### **Text Books:**

1. Jyotsna Sengupta, 'Fundamentals of Computer Organization and Architecture', NuTech Books, Deep and Deep Publications, New Delhi, 2009,

#### **References:**

1. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India.
2. J.P.Hayes Tata McGraw-Hill, Computer Organization and Architecture TMH
3. William Stallings, "Computer System Architecture", PHI

## **BCA-214: Object Oriented Programming using C++**

**Max Marks: 80  
Hrs.**

**Maximum Time: 3**

**Min Pass Marks: 35%  
Hrs**

**Lectures to be delivered: 45-55**

### **(A) INSTRUCTION FOR THE PAPER SETTER**

The question paper will consist of four sections A, B, C and D. Section A, B and C will have two questions from the respective section of the syllabus carrying 15 marks for each question. Section D will consist of 8-10 short answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

### **(B) INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

#### **SECTION-A**

Evolution of OOP: Procedure Oriented Programming, OOP Paradigm, Advantages and disadvantages of OOP over its predecessor paradigms.

Characteristics of Object Oriented Programming: Abstraction, Encapsulation, Data hiding, Inheritance, Polymorphism, Code Extensibility and Reusability, User defined Data Types.

Introduction to C++: Identifier, Keywords, Constants,

Operators: Arithmetic, relational, logical, conditional and assignment. sizeof operator, Operator precedence and associativity.

Type conversion, Variable declaration, expressions, statements, manipulators

Input and output statements, stream I/O, Conditional and Iterative statements, breaking control statements.

#### **SECTION-B**

Storage Classes: Automatic, Static, Extern, Register.

Arrays, Arrays as Character Strings, Structures, Unions, Enumerations and User defined types.

Pointers: Pointer Operations, Pointer Arithmetic, Pointers and Arrays, Multiple indirections, Pointer to functions. Functions: Prototyping, Definition and Call, Scope Rules. Parameter Passing: by value, by address and by reference, Functions returning references, Const functions, recursion, function overloading, Default Arguments, Const arguments.

Classes and Objects: Class Declaration and Class Definition, Defining member functions, making functions inline, Nesting of member functions, Members access control. this pointer.

Objects: Object as function arguments, array of objects, functions returning objects, Const member functions.

Static data members and Static member functions.

Friend functions and Friend classes, Constructors: properties, types of constructors (Default, parameterized and copy), Dynamic constructors, multiple constructors in classes.

Destructors: Properties, Virtual destructors. Destroying objects. Rules for constructors and destructors.

Array of objects. Dynamic memory allocation using new and delete operators, Nested and container classes

## SECTION-C

Inheritance: Defining derived classes, inheriting private members, single inheritance, types of derivation, function redefining, constructors in derived class.

Types of inheritance: Single, Multiple, Multilevel and Hybrid. Types of base classes: Direct, Indirect, Virtual, Abstract. Code Reusability.

Polymorphism: Methods of achieving polymorphic behavior.

Operator overloading: overloading binary operator, overloading unary operators, rules for operator overloading, operator overloading using friend function. Function overloading: early binding,

Polymorphism with pointers, virtual functions, late binding, pure virtual functions and abstract base class.

Files and streams: Classes for file stream operations, opening and closing of files, stream state member functions, binary file operations, structures and file operations, classes and file operations, I/O with multiple objects, error handling, sequential and random access file processing.

### Text Books

1. E. Balagurusamy, “ Object Oriented Programming with C++”, Tata McGraw-Hill.
2. Deitel and Deitel, “C++ How to Program”, Pearson Education.

### References:

1. Herbert Schildt, “The Complete Reference C++”, Tata McGraw-Hill.
2. Robert Lafore, “Object Oriented Programming in C++”, Galgotia Publications.
3. Bjarne Strastrup, “The C++ Programming Language”, Addison- Wesley Publication Co.
4. Stanley B. Lippman, Josee Lajoie, “C++ Primer”, Pearson Education, 2002

## **BCA-215: Fundamentals of Database Management System**

**Max Marks: 80  
Hrs.**

**Maximum Time: 3**

**Min Pass Marks: 35%  
Hrs**

**Lectures to be delivered: 45-55**

### **(A) INSTRUCTION FOR THE PAPER SETTER**

The question paper will consist of four sections A, B, C and D. Section A, B and C will have two questions from the respective section of the syllabus carrying 15 marks for each question. Section D will consist of 8-10 short answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

### **(B) INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

#### **SECTION-A**

**Overview of DBMS:** database concepts, database management systems, database structuring techniques, advantages and disadvantages of DBMS.

**Architecture of DBMS:** user, software, hardware, DBA and his responsibilities.

**Entity Relationship Model:** entity, entity set, attributes, tuples, domains, primary key, secondary key, super key, candidate key.

#### **SECTION-B**

**3 Schemas of Database:** conceptual schema, internal schema, external schema of DBMS, mapping from internal to conceptual and conceptual to external schema.

**DBMS Models:** hierarchical model, network Model, relational Model - their features, structure, advantages, and disadvantages, comparative study of network, hierarchical and relational Models.

#### **SECTION-C**

**MS-ACCESS:** Introduction to MS-ACCESS, working with database and tables, queries in MS-ACCESS, applying integrity constraints, introduction to forms, sorting and filtering, controls, Reports and Macro: creating reports, using macros.

#### **References :**

1. B.P. Desai, "Database management system" BPB publications, New Delhi.
2. D. Naveen Prakash, "Introduction to Database management" TMH publications, 1993

**BCA-216: Software Lab – V**  
**(Based on paper BCA-214: Object Oriented Programming using C++)**

**Max Marks: 50**  
**Hrs.**

**Maximum Time: 3**

**Min Pass Marks: 35%**  
**50 Hrs**

**Practical Sessions to be conducted: 40-**

This laboratory course will comprise as exercises to supplement what is learnt under paper BCA-214: Object Oriented Programming using C++. Students are required to develop the following programs in C++ language with internal documentation:

1. Create a class to store student information with data members as roll no, name, marks in 3 subjects total and average using constructor where ever required.
2. Write a program using Abstract Data Type (ADT) to find largest and smallest elements in an array.
3. Write a program in C++ to implement Bubble sort and Selection Sort
4. Write a program in C++ to implement Quick Sort.
5. Write a program using ADT to perform linear search.
6. Write a program using ADT to perform binary search.
7. Write a program using ADT to add and subtract two matrices.
8. Write a program using ADT to Multiply and Transpose two matrices.
9. Write a program to read 2 integers and perform simple arithmetic operations using pointer technique. (Use new and delete operators)
10. Write a program to read an array and display an array using dynamic memory allocation.
11. Write C++ programs to implement Stack ADT using array.
12. Write C++ programs to implement Queue ADT using array.
13. Write a program to create memory space for a class object using new operator and to destroy it using delete operator.
14. Develop an Object Oriented program in C++ to read emp name, emp code, designation, experience and age. Construct the database with suitable member functions for initializing and destroying the data using constructor and destructor and dynamic memory allocation operators new and delete.
15. Write a program in C++ to prepare mark sheet of an University exam by reading stuname, rollno, subname, subcode, internal marks, external marks. Design a base class consisting data members such as student name, roll no, sub name. Derived class consists data members such as sub code, internal marks, external marks, construct oops data to search for a record i.e. be printed.

**The break up of marks for the practical will be as under**

<b>i. Lab Record (Internal Assessment)</b>	<b>10 Marks</b>
<b>ii. Viva Voce (External Evaluation)</b>	<b>20 Marks</b>
<b>iii. Program Development and Execution(External Evaluation)</b>	<b>20 Marks</b>

**BCA-217: Software Lab – VI**  
**(MS ACCESS lab based on paper BCA-215: Fundamentals of Database Management System)**

**Max Marks: 50**

**Maximum Time: 3**

**Hrs.**

**Min Pass Marks: 35%**

**Practical Sessions to be conducted: 40-**

**50 Hrs**

This laboratory course will comprise as exercises to supplement what is learnt under paper BCA-215: Fundamentals of Database Management System. Students are required to practices following:

1. Creating tables in MS ACCESS using different ways.
2. Import and export data from MS ACCESS.
3. Creating queries in MS ACCESS for selection, projection, Cartesian product, union, intersection and difference.
4. Creating queries in MS ACCESS for different types of joins.
5. Creating forms in MS ACCESS
6. Creating application using switchboard.

**The break up of marks for the practical will be as under**

- |  |                 |
|--|-----------------|
| <b>i. Lab Record (Internal Assessment)</b>                         | <b>10 Marks</b> |
| <b>ii. Viva Voce (External Evaluation)</b>                         | <b>20 Marks</b> |
| <b>iii. Program Development and Execution(External Evaluation)</b> | <b>20 Marks</b> |

## BCA 218 Environmental Studies

Time allotted: 3 hours  
Lectures : 50

Total

Total Marks : 100  
Pass Marks : 35  
Written Paper : 75 Marks  
Field Work : 25 Marks

### Instructions

The written paper will have two parts. First part will be of 25 marks it will contain 10 questions, the students will attempt 5 questions of five marks out of this part. The answer to these questions should not-exceed 50 words each.

Part second will be of 50 marks and will contain 10 essay type questions. The candidates will attempt 5 questions out of this part and the answer to each question should not exceed 500 words. Each question will carry ten marks.

### Unit 1: The Multidisciplinary nature of environmental studies

Definition, scope and importance

(2 Lectures)

Need for public awareness.

### Unit 2 Natural Resources :

#### Renewable and non renewable resources:

Natural resources and associated problems.

- a) Forest resources: Use and over - exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
  - b) Water resources: Use and over utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.
  - c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
  - d) Food Resources : World Food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging; salinity, case studies.
  - e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies.
  - F) Land resources: Land as a resource, land degradation, man included landslides, soil erosion and desertification.
- Role of an individual in conservation of natural resources
  - Equitable use of resources for sustainable lifestyles.

### Unit 3: Ecosystems

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers.
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and functions of the following ecosystem:-
  - a Forest ecosystem
  - b Grassland ecosystem
  - c Desert ecosystem
  - d Aquatic ecosystems ( ponds, streams, lakes, rivers, oceans, estuaries)

( 6 lectures)

### Unit 4: Biodiversity and its conservation

- introduction - - Definition: species and ecosystem diversity
- Biogeographically classification of India
- Value of biodiversity: consumptive use, productive, social, ethical, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as a mega-diversity nation

- Hot spots of biodiversity
- Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

(8 Lectures)

### Unit 5: Environmental Pollution

#### Definition

- Causes, effects and control measures of:-
  - a) Air Pollution
  - b) Water Pollution
  - c) Soil Pollution
  - d) Marine Pollution
  - e) Noise Pollution
  - f) Thermal Pollution
  - g) Nuclear Hazards
- Solid waste Management Causes, effects and control measures of urban and industrial wastes.
- Role of and individual in prevention of pollution
- Pollution case studies
- Disaster management : floods, earthquake, cyclone and landslides.

(8 Lectures)

### Unit 6: Social Issues and the Environment

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns  
Case studies.
- Environmental ethics: Issues and possible solutions
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies
- Wasteland reclamation
- Consumerism and waste products.
- Consumerism and waste products
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and control of pollution) Act
- Wildlife Protection Act.
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness.

(7 Lectures)

### Unit 7: Human Population and the Environment

- Population growth, variation among nations.
- Population explosion - Family Welfare Programme.
- Environment and human health
- Human Rights
- Value Education
- HIV/ AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and human health
- Case Studies

(6 Lectures)

### Unit 8: Field Work

- Visit to a local area to document environmental areas, river/ forest/ grassland/ hill/ mountain
- Visit to a local polluted site - Urban/ Rural/ Industrial/ Agriculture
- Study of common plants, insects, birds
- Study of simple ecosystems-pond, river, hill slopes, etc. (Field work Equal to 5 Lecture hours)

## BCA-221: English Communication Skills – II

**Max Marks: 80**

**Maximum Time: 3**

**Hrs.**

**Min Pass Marks: 35%**

**Lectures to be delivered: 45-55**

**Hrs**

**English Communication Skills** has been designed to develop the student's communicative competence in English. Therefore, content selection is determined by the student's present and future academic, social and professional needs.

### **Texts Prescribed for Grammar and Vocabulary:**

W. Standard Allen: Living English Structure (Orient Longman)

Wilford D. Best: The Student's Companion (Rupa)

### **SECTION A: Comprehension**

**25**

#### **Marks**

One unseen passage with a variety of questions including 05 marks for vocabulary such as word formation and inferring meaning. The total range of the passage including a poem or a stanza, should be around 300-400 words.

15 Marks

One unseen passage 250-300 words in length for note-making and summarizing or précis

10 Marks

The passages could be any one of the types such as **Factual passages** e.g. illustrations, description, reports, **Discursive passages** involving opinion e.g. argumentative, persuasive **Literary passages** e.g. poems, extracts from fiction, biography, autobiography, travelogue etc.

### **SECTION B: Grammar**

**25**

#### **Marks**

Reordering of words and sentences (Attempt any 5 out of 7)

5 Marks

Composing a dialogue based on the given input (Attempt any 5 out of 7)

5 Marks

Error correction in sentences (Attempt any 5 out of 7)

5 Marks

Drafting questions/questionnaires based on given input (Attempt any 5 out of 7)

5 Marks

converting one kind of sentence/clause into a different kind of structure (Attempt any 5 out of 7)

5 Marks

### **SECTION C: Composition**

**30**

#### **Marks**

One out of two short formal classified advertisement writing tasks such as for matrimonial, job vacancies, sale/purchase etc. (50-80 words)

5 Marks

One out of two Telegram writing in proper format with sender and receiver address (50-80 words)

5 Marks

One out of two long and sustained writing tasks such as writing a speech, a report or writing an article based on verbal/visual input (200 words).

10 marks

One out of two letters to the editors on various social, national and international issues (125-150 words)

10 Marks

## **BCA-222: Computer Networks**

**Max Marks: 80  
Hrs.**

**Maximum Time: 3**

**Min Pass Marks: 35%  
Hrs**

**Lectures to be delivered: 45-55**

### **(A) INSTRUCTION FOR THE PAPER SETTER**

The question paper will consist of four sections A, B, C and D. Section A, B and C will have two questions from the respective section of the syllabus carrying 15 marks for each question. Section D will consist of 8-10 short answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

### **(B) INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

#### **SECTION-A**

Introduction to Computer networks, Applications, Network hardware and Software (protocol hierarchies, design issues for layers, interfaces and services: connection oriented and connection less), Network structure and architecture- point to point, multicast, broadcast, Classification of networks-LAN, MAN and WAN. Reference models, the OSI reference model, TCP / IP reference model. Comparison between OSI and TCP / IP models.

#### **SECTION-B**

Data Link Layer: Design issues, Services to network layer, Framing, Error control, Flow control, Elementary data link protocols- unrestricted simplex protocol, simplex stop and wait protocol, simplex protocol for a noisy channel.  
Network layer: Design issues, Services to the transport layer, Routing algorithms- Static/ non-adaptive and dynamic/adaptive algorithms. Congestion control algorithms – the leaky bucket algorithm, the token bucket algorithm.

#### **SECTION-C**

Transport layer, design issues, connection management-addressing, establishing and releasing connection, transport layer protocols- TCP, UDP.  
Application layer: The DNS Name Space, Electronic Mail, The World Wide Web,  
Network security: Introduction to cryptography, substitution ciphers, transposition ciphers, one-time pads, two fundamental cryptographic principles, public-key algorithms (RSA, other Public-key algorithms), digital signatures (symmetric-key signatures, public key-signatures, message digests

#### **Text Books:**

1. B Forousan, Introduction to data communication and networking
2. A S Tanenbaum, Computer Networks.

## **BCA-223: Management Information System**

**Max Marks: 80**

**Min Pass Marks: 35%**

**Maximum Time: 3 Hrs.**

**Lectures to be delivered: 45-55 Hrs**

### **(A) INSTRUCTION FOR THE PAPER SETTER**

The question paper will consist of four sections A, B, C and D. Section A, B and C will have two questions from the respective section of the syllabus carrying 15 marks for each question. Section D will consist of 8-10 short answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

### **(B) INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

#### **SECTION-A**

**Management Information system:** Meaning and definition, Role of information system, Nature and scope of MIS.

**Information and system concepts:** Definition and types of information, Information quality, dimensions of information, value of information, general model of human as an information processor. System related concepts, elements of a system, and types of system.

**Role and importance of Management:** Introduction, levels and functions of management.

#### **SECTION-B**

Structure and classification of MIS, Components of MIS, Framework for understanding MIS: Robert Anthony's hierarchy of management activity, Information requirements and levels of management.

Decision making concept, types of decisions, methods of choosing among alternatives, Role of MIS in decision making.

Simon's model of decision making, Structured and unstructured decisions.

#### **SECTION-C**

**Development of MIS:** Stages in the development of MIS, System development approaches: Waterfall model, Prototyping, Iterative enhancement model, Spiral model.

Applications of information systems in Functional areas: Marketing MIS, Financial MIS, Production MIS, Personnel MIS.

**Decision Support Systems:** Definition and characteristics, MIS versus DSS, Tools and Models for decision support.

**Text Book:**

1. D.P. Goyal, "Management Information Systems: Managerial Perspectives", Macmillan India Ltd.

**References:**

1. Robert G. Murdick, Joel E. Ross, James R. Claggett, "Information Systems for Modern Management", Prentice Hall of India Pvt. Ltd.
2. Gordon B. Davis, M.H. Olson, "Management Information Systems: Conceptual Foundations, Structure & Development", McGraw-Hill Book Co.
3. W.S. Jawadekar, "Management Information Systems", Tata McGraw-Hill Publishing Co.

## **BCA-224: Computer Oriented Numerical and Statistical Methods**

**Max Marks: 80**

**Min Pass Marks: 35%**

**Maximum Time: 3 Hrs.**

**Lectures to be delivered: 45-55 Hrs**

### **(A) INSTRUCTION FOR THE PAPER SETTER**

The question paper will consist of four sections A, B, C and D. Section A, B and C will have two questions from the respective section of the syllabus carrying 15 marks for each question. Section D will consist of 8-10 short answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

### **(B) INSTRUCTIONS FOR THE CANDIDATES**

1. Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.
2. Use of Non-Programmable Scientific calculator is allowed.

### **SECTION-A**

**Basics:** Floating point representation of numbers, arithmetic operation with normalised floating point numbers and its consequences, errors in numbers, binary representation of numbers.

**Solution of transcendental equations:** Bi-section method, Regula-falsi method, Newton/Raphson method, Secant method

### **SECTION-B**

**Solution of simultaneous algebraic equations:** Gauss elimination method, pivoting, ill-conditioned equations, Gauss-Seidel iterative method, comparison of direct and iterative method.

**Interpolation:** Lagrange's interpolation, Newton Interpolation

**Curve Fitting:** Linear regression, Polynomial regression, Exponential Regression

### **SECTION-C**

**Introduction to Statistics:** Meaning, scope, collection, classification of data. Application based on and processing logic of measures of central tendency, dispersion.

**Bivariate Data:** Correlation, Meaning, and Type of correlation, correlation and causation, methods of studying correlation, algorithm to compute Karl Pearson's Correlation and rank correlation. Applications based on correlation.

**Linear Regression:** Processing logic of and numericals based on fitting of regression lines (Using least square method).( Properties without Proofs)

### **Text Book:**

1. V. Rajaraman, "Computer Oriented Numerical Methods", PHI, New Delhi, 1994
2. Murray R Spiegel, Larry J. Stephens - "Statistics" Schaum's Outlines

### **References:**

1. J.H. Mathews, "Numerical Methods for Computer Science, Engineering and Mathematics", PHI,
2. M K. Jain, S.R.K. Iyengar and R.K. Jain, "Numerical Methods for Scientific and Engineering Computation", Wiley Eastern Limited, New Delhi,
3. S.C. Chopra and R.P.C Anale, "Numerical Methods for Engineers", McGraw-Hill, New York

## **BCA-225: Relational Database Management System with Oracle**

**Max Marks: 80  
Hrs.**

**Maximum Time: 3**

**Min Pass Marks: 35%  
Hrs**

**Lectures to be delivered: 45-55**

### **(A) INSTRUCTION FOR THE PAPER SETTER**

The question paper will consist of four sections A, B, C and D. Section A, B and C will have two questions from the respective section of the syllabus carrying 15 marks for each question. Section D will consist of 8-10 short answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly. Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

### **(B) INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all by selecting at least one question from the section A, B and C. Section D is compulsory.

#### **SECTION-A**

**Relational Model:** storage organisations for relations, relational algebra - set operators, relational operators, relational calculus - domain calculus, tuple calculus.

**Decomposition of Relation Schemes:** functional dependencies, multivalued dependencies, normal forms for relational schemes.

**Relational Query Language:** DDL, DML, DCL.

**Database Integrity:** domain integrity, entity integrity, referential integrity.

#### **SECTION-B**

**Introduction to Oracle:** Oracle as client/server architecture, getting started, creating, modifying, dropping databases. Inserting, updating, deleting data from databases, SELECT statement, Data constraints ( Null values, Default values, primary, unique and foreign key concepts), computing expressions, renaming columns, logical operators, range searching, pattern matching, Oracle functions, grouping data from tables in SQL, manipulating dates.

#### **SECTION-C**

**Working with SQL:** triggers, use of data base triggers, database triggers Vs. SQL\*forms, types of triggers, how to apply database triggers, BEFORE vs. AFTER triggers, combinations, syntax for creating and dropping triggers.

#### **Text Book :**

1. B.P. Desai, "Database management system" BPB publications, New Delhi.

#### **Reference:**

1. C.J. Date, "An Introduction to Data Base Systems", 3rd Ed., Narosa Publishers, 1997
2. Jeffrey D. Ullman, "Principles of Database Systems", 2nd Ed., Galgotia Pub., 1984.
3. D. Kroenke., "Database Processing", Galgotia Publications, 1987.
4. Henry F. Korth, "Database System Concepts", McGraw Hill. Inc., 1997.
5. Naveen Prakash, "Introduction to Database Management", TMH, 1993.
6. Ivan Bayross, "Oracle 7 The complete reference", BPB Publications.
7. Bobrowsky, "Client server architecture and Introduction to Oracle 7", 1996

**BCA-226: Software Lab – VII****(Based on paper BCA-224: Computer Oriented Numerical and Statistical Methods)****Max Marks: 50****Maximum Time: 3 Hrs.****Min Pass Marks: 35%****Practical Sessions to be conducted: 40-50 Hrs**

This laboratory course will comprise as exercises to supplement what is learnt under paper BCA-224: Computer Oriented Statistical Methods. Students are required to develop the following programs in C/C++ language with internal documentation:

1. Write a program to compute the mean and weighted mean of raw data.
2. Write a program to compute the mean and weighted mean of discrete series (x, f).
3. Write a program to compute the mean and weighted mean of continuous series.
4. Write a program to compute the mode and median of raw data.
5. Write a program to compute the median of discrete series (x, f).
6. Write a program to compute the median of continuous series.
7. Write a program to compute the mode of discrete series (x, f).
8. Write a program to compute the mode of continuous series.
9. Write a program to compute the standard deviation and variance of discrete series.
10. Write a program to compute the standard deviation and variance of continuous series.
11. Write a program to compute the correlation using Karl Pearson's Correlation
12. Write a program to compute the regression coefficients.

**The break up of marks for the practical will be as under**

<b>i. Lab Record (Internal Assessment)</b>	<b>10 Marks</b>
<b>ii. Viva Voce (External Evaluation)</b>	<b>20 Marks</b>
<b>iii. Program Development and Execution(External Evaluation)</b>	<b>20 Marks</b>

**BCA-227: Software Lab – VIII**  
**(Oracle lab based on paper BCA-225: Relational Database Management System with Oracle)**

**Max Marks: 50**  
**Hrs.**

**Maximum Time: 3**

**Min Pass Marks: 35%**  
**50 Hrs**

**Practical Sessions to be conducted: 40-**

This laboratory course will comprise as exercises to supplement what is learnt under paper BCA-225: Relational Database Management System with Oracle. Students are required to practice writing SQL statements for

1. Creating the Table
2. Querying the record using order by clause
3. Querying the record using group by clause
4. Querying the record using multiple conditions
5. Create Synonyms
6. Create Sequences
7. Create Views
8. Create Indexes
9. Create triggers
10. Create cursors for procedures

**The break up of marks for the practical will be as under**

- |  |                 |
|--|-----------------|
| <b>i. Lab Record (Internal Assessment)</b>                         | <b>10 Marks</b> |
| <b>ii. Viva Voce (External Evaluation)</b>                         | <b>20 Marks</b> |
| <b>iii. Program Development and Execution(External Evaluation)</b> | <b>20 Marks</b> |