PROGRAMME PROJECT REPORT

BACHELOR OF COMPUTER APPLICATION

CENTRE FOR DISTANCE & ONLINE EDUCATION {CDOE}

Programme Name	:-	**Bachelor of Computer Application**
Eligibility	:-	**10+2 or equivalent**
Minimum Duration	:-	**3 years (6 Semesters)**
Maximum Duration	:-	**5 years**

Programme's Mission and Objective:

Computer science is mostly associated with problem-solving - an essential life skill. This course offers students the opportunity to design, develop, and analyse software and hardware as a tool for solving problems in a variety of business, scientific, and social contexts. The Bachelor of Computer Application degree programme provides students with a broad foundation in different aspects of Computer, Software Development/Support, & other service-based industries. The student gains exposure to diversity in the field of Information Technology. The programme prepares them for employment in the field of Information Technology Sector.

Relevance of the Programme with HEI Mission and Goals:

In Arunachal Pradesh, the youth looks forward to shape-up their career in Information Technology or any IT-based services sector. Bachelor of Computer Application Technology can help young students learn, acquire computer skills that enhance their performance in this digital age. The impact of IT and computer science in everyday life from health to communication has only made the world a better, faster and more connected place to live. In order to enhance the brilliant minds of the students to contribute more, the need of local students it is very important to launch this programme

Nature of Prospective Target Group of Learners:

The curriculum of the programme is designed after understanding the diverse needs of the students of the state. We are in the midst of a technological transition and it is up to us to decide how it will influence our world and shape it. The literacy rate of the state is below the average literacy rate of India. This programme will enable the students to be self-dependent and participate in the development of the state and the country through the computer application degree.

Appropriateness of the Programme:

Technological advancements mean there is a constant demand for brilliant tech minds able to design, maintain, and repair both gadgets and codes. The Bachelor of Computer Application degree is designed to provide students with a wide range of technological skills, while building competence in the IT Field. The University, therefore, plan the degree such that in addition to their major, students are exposed to Software development/support skills,

Expected outcomes: BCA in general is one of the most actively enrolled courses presently. Therefore the oppourtunity to grab jobs in this present given times have expotentially increased. There are many career options available for students after completing this programme because of pursing a bachelor's degree in computer application. Ultimately a graduate can finally be ready and become an expert in understanding, analyzing, and developing computer programmes in the areas related to algorithms, networking, and web designs.

Instructional Design:

1. Title of the Programme : Bachelor of Computer Application

2. Minimum Duration of the Programme : 3 Years {6 Semester}

3. Maximum Duration of the Programme : 5 Years

4. Weather Listed in Section (22) of UGC Act : Yes

5. Level of the Programme : UG-I to UG-III

6. Eligibility : 10+2/ 10+3 (Any Stream) or eq.

7. Optional Early Exit Certification : Not Applicable

8. Credit Transfer : Applicable

   8.1 To the Second Year of Programme: For the Candidates who has successfully completed First Year of Programme from a recognized University/ Institution or any other Institution recognized by the Arunachal University of Studies. A student admitted under this system requires submitting fees for Second Year of the Programme along with Credit Transfer fees as prescribed by the University from time to time.

   8.2 To the Third Year of Programme: For the Candidates who has successfully completed First & Second Years of Programme from a recognized University/ Institution or any other Institution recognized by the Arunachal University of Studies. A student admitted under this system requires submitting fees for Third Year of the Programme along with Credit Transfer fees as prescribed by the University from time to time.

   8.3 The cases where exact title of Programme is different from the aforementioned Programme Title and more than 75% credits earned in previous qualification matches with the Programme Credits then such Credit Transfers are permitted by the Arunachal University of Studies as per 8.1 and 8.2.

9. Skill Based Credit Transfer : Applicable

   9.1 A Candidate who has successfully completed minimum two years of work experience in relevant field or have completed minimum of two year professional certification from an institution after prescribed qualification for the admission into programme are eligible for Skill Based Credit Transfer. The Skill Based Credit Transfer candidates have to appear in all theory examinations in order to earn minimum Two Years credits of the Programme.

   9.2 To the Second Year of Programme: Such Candidates are required to earn mismatched theory, practical and industrial credits of First Year along with Second Year Examinations. A student admitted under this system requires submitting fees for First and Second Year of the

Programme along with Skill Based Credit Transfer fees as prescribed by the Arunachal University of Studies from time to time.

9.3 To the Third Year of Programme: Such Candidates are required to earn mismatched theory, practical and industrial credits of Second Year along with Third Year Examinations. A student admitted under this system requires submitting fees for Second and Third Year of the Programme along with Skill Based Credit Transfer fees and Lateral Entry Fees/ Credit Transfer Fees (whichever applicable) as prescribed by the Arunachal University of Studies from time to time.

10. Lateral Entry   : Not Applicable

11. Division:

    The University will award the Divisions to successful candidates in accordance with Section 22 of Rules and Regulations made under the Arunachal University of Studies Act (No. 9 of 2012).

12. Grading Scale:

    The Grading Scale of the University will be in accordance with Section 23 of Rules and Regulations made under the Arunachal University of Studies Act (No. 9 of 2012).

13. Programme Credit Distribution:

    The Credit System and Programme Credit Distribution of the University will be in accordance with Section 45 and Section 46 of the First Statutes made under the Arunachal University of Studies Act (No. 9 of 2012).

14. Abbreviations and Formulae for Performance Acknowledgement:

    Abbreviations and Formulae for Performance Acknowledgement of the University will be in accordance with Section 25 of the Rules and Regulations made under the Arunachal University of Studies Act (No. 9 of 2012).

15. Admission Procedure:

    15.1 Admission in Bachelor of Computer Application Annual/ Semester programme of study shall be made on Merit.

    15.2 Admission cannot, however, be claimed by any candidate as a matter of right. The admission or re-admission of a candidate shall be entirely at the discretion of the University which may refuse to admit any student without assigning any reason there for.

    15.3 On selection for admission to the programme, the candidate shall, within the time fixed by the Dean/ Director deposit the fees prescribed for the programme. If the candidate fails to deposit fees within the stipulated time, the selection shall automatically stand cancelled. Such a candidate shall not be admitted to the concerned programme unless a fresh order of selection and extension of date for payment of fees is issued.

    15.4 The candidates other than the domicile of Arunachal Pradesh are required to fulfill the entry criteria as prescribed by the Government of Arunachal Pradesh time to time.

15.5 The Foreign Nationals are eligible for the Programme. Applications of foreign nationals nominated by the Government of India under scholarship schemes and self-financing Foreign Nationals shall be entertained for the aforesaid programme. The Foreign Nationals are required to obtain Restricted Permit from the Government of Arunachal Pradesh in addition to other papers required by Govt. of India before coming to Arunachal Pradesh.

16. Attendance:

16.1 Attendance of a newly admitted candidate shall be counted from the date of his/her admission, or date of beginning of classes whichever is later, while in the case of promoted candidates, attendance shall be counted from the date on which respective class begins. However, in case of promotion after declaration of results of supplementary examination (if any), the attendance will be counted from the date of admission in the respective case.

16.2 There shall be an Attendance Monitoring Committee in the Faculty under the Chairmanship of the Dean/ Director.

16.3 The Condonation upto 25% can be considered for the following specific cogent reasons:

- Participation in NCC/NSC/NSS Camps duly supported by certificate.

- Participation in University or College Team Games or Interstate or Inter-University tournaments, duly supported by certificate.

- Participation in Educational Excursions, which form a part of teaching in any subject conducted on working days duly certified by the Dean/ Director.

- University Deputation for Youth Festival duly certified by the Dean/ Director.

- Prolonged illness duly certified by the Medical Officer or any other Registered Medical Practitioner, provided such certificate is submitted to the Dean/ Director.

16.4 Minimum attendance criteria will be decided by Dean/ Director of Concerned Faculty from time to time.

16.5 There shall be no attendance criteria for External Candidates.

17. Programme Fee:

Programme Fee will be displayed on official website of the University from time to time.

18. Examination and Result:

18.1 The Distribution of Continuous Internal Assessment and Term End Examination of the programme will be in accordance with Section 24 of the Rules and Regulations made under the Arunachal University of Studies Act (No. 9 of 2012).

18.2 Result will be displayed on the official website of the University. The Statement of Grades will be issued by the Controller of Examination.

18.3 Students can apply for Re-Totaling/ Re-Evaluation on demand as per the procedure in practice from time to time.

18.4 Students designated in Grade F or the students desirous of improving their grades can apply for the same through Backlog/ Improvement examination as per the procedure in practice from time to time.

19. Programme Contents: -

The Total Marks includes Continuous Internal Assessment and End Term Examination. The bifurcation of Continuous Internal Assessment and End Term Examination marks will be in accordance with Section 24 of the Rules and Regulations made under the Arunachal University of Studies Act, 2012 (9 of 2012).

First Semester			
S. No.	Name of Subject	Credits	Total Marks
1	Foundation Course in Environmental Science	4	100
2	Programming Fundamentals Using C	5	100
3	Principle of Management	4	100
4	Database Management System	4	100
5	Discrete Mathematics	4	100
6	English Grammar & Composition	3	100
Total		**24**	

Second Semester			
S. No.	Name of Subject	Credits	Total Marks
1	Operating System	4	100
2	Computer Architecture	4	100
3	Basics of Internet	4	100
4	Object Oriented Programming Using C++	5	100
5	Practical	4	100
Total		**21**	

Third Semester			
S. No.	Name of Subject	Credits	Total Marks
1	Foundation Course in Business Entrepreneurship and Management	2	100
2	Computer Networks	5	100
3	Business Communication	4	100
4	Data Structure	5	100
5	Software Project Management	4	100
6	English Literature – I	4	100
Total		**24**	

Fourth Semester

S. No.	Name of Subject	Credits	Total Marks
1	Formal Language and Automata Theory	4	100
2	Data Communication	4	100
3	System Analysis & Design	4	100
4	Financial Accounting	4	100
5	Practical	4	100
Total		**20**	

Fifth Semester

S. No.	Name of Subject	Credits	Total Marks
1	Moral & Value Education	2	100
2	Multimedia Technology	5	100
3	Web Technology	6	100
4	Client Server Technology	6	100
5	English Literature – II	5	100
Total		**24**	

Sixth Semester

S. No.	Name of Subject	Credits	Total Marks
1	Visual Basic	5	100
2	Computer Graphics	5	100
3	Software Engineering	5	100
4	Project	5	100
Total		**20**	

Total No. of Credits of Programme: 132

20. **Detailed syllabus: -**

First Semester

S. No.	Name of Subject	Credits	Total Marks
1	Foundation Course in Environmental Science	4	100
2	Programming Fundamentals Using C	5	100
3	Principle of Management	4	100
4	Database Management System	4	100
5	Discrete Mathematics	4	100
6	English Grammar & Composition	3	100
Total		**24**	

Subject Name: Foundation Course in Environmental Science

Unit 1: The Multidisciplinary nature of environmental studies Definition; Scope and importance, Need for public awareness.

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 induced landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources.

Equitable use of resources for sustainable lifestyles.

Unit 2: 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 function of the following ecosystem:

a.   Forest ecosystem

b.   Grassland ecosystem

c.   Desert ecosystem

d.   Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Biodiversity and its Conservation

a.   Introduction-Definition: genetic, species and ecosystem diversity.
b.   Biogeographical classification of India.
c.   Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
d.   Biodiversity at global, National and local levels.
e.   India as a mega-diversity nation.
f.   Hot-spots of biodiversity.
g.   Threats to biodiversity: habital loss, poaching of wildlife, man-wildlife conflicts.

h.   Endangered and endemic species of India.

i.   Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit 3: Environmental Pollution:

- 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 an individual in prevention of pollution.

 - Pollution case studies.

 - Disaster management: floods, earthquake, cyclone and landslides.

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.

- 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.

Unit 4: 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.

Unit 5: Field Work (Practical)

- Visit to a local area to document environmental assets-river/forest/grassland/hill/mountain.

- Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.

- Study of common plants, insects, birds.

- Study of simple ecosystems-pond, river, hill slopes, etc.

Subject Name: PROGRAMMING FUNDAMENTALS USING C

Unit-I

1. **Introduction to computer system:** Introduction, Characteristics of computer, Drawbacks of computers, Generations of Computers
2. **Computer Organization:** Architecture of Computer System
3. **Number System:** Introduction, Commonly Used Number System, Decimal, Binary, Octal, Hexadecimal, Converting from one number system to another
4. **Binary Arithmetic:** Introduction, Binary Addition, Subtraction, Multiplication, Division, Representations of characters, BCD Code, EBCDIC, ASCII, Fixed Point Representation, Floating Point Representation
5. **Algorithms and Flowchart:** Algorithms, Characteristics of algorithms, Flowchart, Different Symbols used in Flowcharts.
6. **Computer Languages:** Machine Language, Advantages of Machine Language, Disadvantages of Machine Language, High Level Language, Assembly Language, Software, Type of Software, System Software, Application Software
7. **Input-output Devices:** Introduction, Offline Input Devices, Online Input Devices, Punched Cards, Keyboards, Mouse, Touch Pad, Light Pen, Scanner
8. **Storage Devices:** Introduction, Primary Memory, RAM, DRAM, ROM, PROM, EPROM, Cache Memory, Secondary Memory, Magnetic Tape, floppy, Hard Disk, CD-ROM
9. **Operating System:** Introduction, Type of Operating System, Batch Processing Operating System, Single-user Operating System, Multi-User Operating System, Multi-Processing Operating System, Real Time Operating System, DOS, Functions of DOS

10. **Viruses:** Introduction, Types of Viruses, Antivirus

Unit-II

1. **An introduction to C:** History of C, Feature of C, Structure of a C program, Variables and Data Types, Arithmetic Expressions
2. **Components of C Language:** Character Set, C token, Data Type in C, Operators, Type Casting, Data Conversion
3. **Input / Output Functions:** Formatted Input / Output functions, The print function, The scanf Function, Unformatted Input / Output Function, Character Input / Output Function, String Input / Output Functions
4. **Conditional Statement:** Introduction, If-else statement, Nesting If-else Statement, The switch Statement
5. **Looping:** Introduction, While Loop, Do While Loop, Nesting Loop, The Break Statement, The Continious Statement
6. **Arrays in C:** Array, Two Dimensional Arrays, Passing Array as Parameters, String, Some Library Function for String Handling
7. **Function:** Modular Programming, Top-Down Approach, Structured Programming, function with no Argument and no Return Value, Function Prototype, Storage class in C, Declaring Variables of Specified Storage Classes, Local and Global Variables.
8. **Pointer in C:** Pointer, Passing Pointers as Parameters, Dynamic Memory Allocation, Pointer to Pointer, Pointer to Function.
9. **Structure and Union:** Structure, Array of Structure, Pointer to Structure, Nested Structure, Structure and Function, Difference between Structure and Union.
10. **File Handling in C:** Introduction, Difference between Text and Binary File, Basic File Handling Functions, File Input / Output.
11. **Preprocessor:** Introduction, Functions of a C Preprocessor.

Subject Name: PRINCIPLE OF MANAGEMENT

Unit-I

Planning and Organizing Management

1. **Definitions of Management:** Its Nature and Purpose, Management as a Science and art, the Elements of Science, Patterns of Management Analysis-Systems Approach to Operational Management. Function of Managers. Management and Society - Social Responsibility and Ethics with Reference to India and EN India. Operating in a pluralistic Society, Social Responsibility of Managers, and ethics in Managing. A Broad Overview of the Different Forms of Business Enterprises in India.
2. **Nature and Purpose of Planning:** Types of Plans; Steps in Planning Process - A Rational Approach to Goal Achievement. Objectives - The Nature of Objectives, Evolving Concepts in Management

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by Objectives (MBO), the Process of MBO, Setting Objective, Benefits and Weakness of MBO. The Nature and Purpose of strategies Planning Process , The TOWS Matrix, The Portfolio Matrix , Major Kinds of Strategies and policies, The Three Generic Competitive Strategies by Porter, Effective Implementation of Strategies , Premising and forecasting. Decision Making - The Importance and Limitations of Rational Decision Making, Evaluation of Alternatives, Selecting an Alternative, Programmed and Non-Programmed Decision , Decision Making Under Certainty , Uncertainty and risk, Modern Approaches to Decision Making under Uncertainty, Evaluating the Important for a Decision , Other Actor in Decision Making, Decision Support System , Systems Approach and Decision Making.

3. **Nature and Purpose of Organizing:** Formal and Informal Organization, Organizational Division - The Department, Organization Levels and the span of management, factors Determining an Effective span, organization Environment for Entrepreneur and Entrepreneur, The Structure and process of Reorganizing.

   Department by Simple Members, by time, by Enterprise function, by Territory or Geography, by Customer, By Process or Equipment, and by Product. Matrix Organization, Strategic Business Units, Choosing the Pattern of Departmentation. Authority and Power, Line and staff concepts, Functional Authority, Benefits and Limitations of staff, Decentralization and Delegation of Authority, art of Delegation, Balance as a key to Decentralization.

Unit-II

Functional Methodology

1. **Human Resource Management and Selection :** Definition of Staffing, Defining the managerial job, Systems Approach to HRM- an Overview the Staffing function, Situational Factors Affecting Staffing , Selecting - Matching the Person with the job, Systems Approach , Position Requirements and job Design, Skills and Personal Characteristics Required by Managers, matching Qualifications with position Requirements, Selection-Process, Techniques and Instruments, Orienting and Socializing New Employees. Performance Appraisal -- Purposes and user of appraisal, Problem of Management Appraisal choosing The Appraisal Criteria, Traditional Trait Appraisals, Apprising Managers against Verifiable Objectives, Appraising Managers As Managers, Rewards and Stress of Managing, Formulating the Career Strategy. Manager Development Process and Training, Approaches to Managers Development, On -The- Job training and internal and external Training, Managing Changes, Organizational Conflict, Organizational Development.

2. **Controlling The Basis Control Process:** Critical Control points and Standards, Control as a Feedback System, real-time Information and control Feed Forward Control, requirements for Effective Controls. Budget- Traditional non-budgetary Control Devices, Time-even Network analysis, information technology, use of Computers in handling information, Challenges created by information technology. Control of Overall Performance, budget Summaries and report, Profit and loss Control, Control through return on investment, Direct Control v/s Preventive Control, Developing Excellent Mangers.

Subject Name: DATABASE MANAGEMENT SYSTEM

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1. **Basic - Concepts of Database Systems:** Database Schema, Instance and Database state, The Three-Schema Architecture, Data Independence, DBMS Languages, and People Deal with Databases.

2. **Entry - Relationship Model:** The E- R Model, Entity Relationship Diagram, Composite versus Atomic Attributes, Role Names Recursive Relationships, Constraints on Relationship Types.

3. **Data Models and Its Implementation:** The Hierarchical Data Model, the Network Data Model, Network Modeling Concepts, the Relational Model.

4. **Introduction to Relational Model:** CODD'S 12 Rules for a fully relational DBMS, Basic Concepts of Relational Model, Referential Integrity Constraints, Enforcing Integrity Constraints.

5. **Oracle: A Relational Database Management System** Oracle System Structure,. Oracle Server, Oracle Database Structure, Oracle Schema Objects, Oracle Data Dictionary.

6. **Structured Query Language: SQL:** Three Parts of SQL, Sub-Queries, Referential Integrity, Some Other SQL Command.

7. **Procedural Language/ Structured Query Language:** PL/SQL Runtime Architecture (PL/SQL Engine), Procedure, Parameters, Packages, Cursors, Triggers.

8. **Relational Algebra and Relational Calculus:** Relational- Oriented Operation, Set-Oriented Operations and Union Compatibility, Aggregate Function and Grouping, Tuple Relation Calculus.

9. **Normalizing Database:** Benefits of Normalization, Function Dependency, the Domain Key Normal Form.

10. **Database Design and Tuning:** The Database Design Process, Requirements and Analysis, Choice of DBMS, Logical Database Design, Database Implementation and Tuning.

11. **Transaction Processing:** Concurrency Control, Recoverability.

12. **Query Processing and Query Optimization:** Query Processing, Query Optimization, Heuristics Rules in Query Optimization, Information used in Cost Function.

13. **Database Recovery Techniques:** Classification of Transaction Failures, Recovery Techniques Base on Deferred Update, Recovery Techniques Base on Immediate Update, Buffer Management.

14. **Concurrency Control Techniques:** The Acid Test for Transaction Management, Binary Locks, Serializability   by Two-Phase Locking, Deadlock Problem.

15. **Data Warehousing:** Data Warehouse Definition, Data Form Legacy Systems, Decision- Support and Executive Information Systems.

16. **Data Mining and Web Mining:** Data Mining Techniques, Future Direction of Data Mining, Data Mining Techniques for Web Searching.

17. **Object- Oriented Database:** History Of OODBMS, Need for Abstract Data Types, O-O Features in SQL3, Hypertext Databases.

18. **Distributed Database:** Structure of Distributed Database, Design of Distributed Database, Advantage of Distributed Database, DDBMS Prototypes.

Subject Name: DISCRETE MATHEMATICS

1. **Relations:** Type of relations, Closure Properties, Equivalence Relations, Matrix representation of relations, Representation of relations as graphs, Partial Ordering relations, n –ARY relations.

2. **Logic and Propositional Calculus:** Introduction, Propositions and Compound Propositions, Basic Logical Operations, Propositions and Truth Tables, Tautologies and Contradictions, Logical

Equivalence, Algebra of Propositions, Conditional and Biconditional statements, Arguments, Logical Implication, Propositional Functions Quantifiers, Negation of Quantified Statements, Normal Forms.

3. **Vectors and Matrices:** Introduction, Vectors, Matrices, Matrix Addition and Scalar Multiplication, Transpose, Square Matrices, Nonsingular Matrices, Inverses, Determinants, Eigen values and Eigen vectors

4. **Graph Theory:** Basic terminologies of graph theory, Multi- graphs and weighted graphs, Paths and circuits, Planar graphs, Complete graphs, Regular graphs, Bipartite graphs, Sub graphs, Isomorphic and Homeomorphic graphs, Coloring covering and portioning, Directed graphs, Trees and rooted trees, Spanning trees and cut sets ,Enumeration of graphs theoretic algorithm and application.

5. **Ordered Sets and Lattices:** Introduction, Ordered Sets, Hasse Diagrams of Partially Ordered Sets, Isomorphic (Similar) Ordered Sets, Well- Ordered Sets, Lattices, Bounded Lattices, Distributive Lattices, Complements, Complemented Lattices.

6. **Algebraic Systems:** Introduction, Operations, Semi-groups, Groups, Sub Groups, Normal Subgroups, and Homeomorphisms, Integral Domains and Fields, Polynomials Over a Field.

Subject Name: ENGLISH GRAMMAR & COMPOSITION

Unit 1: English Grammar

1. **An Introduction to Part of Speech :** Verb, Tenses, Voice, Direct and Indirect Forms of Speech.
2. Prepositions
3. List of Appropriate Preposition Used
4. Sentence
5. Synthesis of Sentences
6. Transformation of Sentences
7. Syntax
8. Punctuation
9. **Vocabulary :** Antonyms and Synonyms, Similar Words Distinguished, One Word Substitutions, More about words, Idioms & Phrases, Idioms.
10. **Common Error :** Some fundamental Rules for Correction, Sentences with error.
11. Comprehension (with answers)

Unit 2 : Composition

1. Paragraph Writing
2. Letter writing
3. Essay Writing
4. The Essays

Second Semester

Second Semester

S. No.	Name of Subject	Credits	Total Marks
1	Operating System	4	100
2	Computer Architecture	4	100
3	Basics of Internet	4	100
4	Object Oriented Programming Using C++	5	100
5	Practical	4	100
Total		21	

Subject Name: OPERATING SYSTEM

1. **Operating System Overview:** Introduction, Objectives and functions, Basic Elements, Evolution of Operating System, Instruction Execution, Interrupts, Memory, Memory Hierarchy, System Components, Operating system Services, System Calls, Virtual Machines, System Design and Implementation.

2. **Process Concepts:** Introduction, Process States, Process Control Block (PCB), Process Scheduling, Co-operating Processes, Threads, Inter Process Communications (IPC).

3. **CPU Scheduling:** Scheduling Criteria, Types of Scheduling, Scheduling Algorithms, Multiple-processor Scheduling, Real-time Scheduling, Disk-Scheduling Policies.

4. **Memory Management:** Introduction, Memory –management Requirements, Logical and Physical Address Space, Swapping, Loading Programs into main memory, Paging, Page Replacement Algorithms, Allocation Of Frames, Translation Look Aside Buffer (TLB), Simple Segmentation with Paging, page Size, Thrashing.

5. **File System:** Introduction, File Organization and Access Methods, Directory Structure, Protection, Security Threats, Intruders, Viruses, File-System Structure, File Allocation Methods, Free-Space Management, Directory Management, Efficiency and Performance of Secondary Storage.

6. **Deadlocks:** Introduction, Principles, Principles Of Deadlocks, System Model, Deadlock Characterization, Resource- allocation Graphs, Methods For Handling Deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection on, Recovery from Deadlock.

7. **Process Management and Synchronization:** Introduction, Critical Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors, Message Passing.

Subject Name: COMPUTER ARCHITECTURE

1. **Processor Organization:** General structure of CPU registers, Stack, operation of stack, ALU and control unit. Instruction format, mathematical operations, fixed point addition, multiplication or division. Principle of arrays and pipeline processors, principle of instruction decoding and implementation, hardwire and micro-instruction based control unit.

2. **Design of Controller:** Identifying micro-instruction, minimizing micro-instruction, size, parallelism in micro instruction, encoding control instruction, timing cycle and clock generation, organization of micro-Programme based control unit.

3. **Memory Organization:** Static memory, dynamic memory, memory hierarchies, memory refresh, paging concept of memory compaction, interleave memory and principle of address

interleaving associative memory, memory segmentation, block address calculation, concept of cache memory.

4. **Data Transfer Technique:** Various I/O devices, IOP, CPU configuration

Subject Name: BASICS OF INTERNET

Unit-I

Internet Technology

1. **Evolution &Protocols**: Internet Evolution, Protocols, Interface Concept, Internet V.s. Internet growth of internet ISP, Connectivity - dial up, leased line, VSAT etc. URLs. Domain names, Portals, Application E-mail File Transfer Protocol, Telnet, Chatting, Data Transmission Protocol, Client/Server, architecture and its characteristics, FTP and its Usages. Telnet Concepts, remote logging, protocols, terminal emulation, message board, Internet Chatting, Voice chat, Text chat.
2. **Web Concept**: World Wide Web, Web Publishing, HTML, Design tools, HTML edition, Image edition, Issue in website creation & maintenance FTP s/w for uploading Use of frames and forms in web pages.

Unit-II

E-Commerce

1. **Introduction to E-Commerce:** Introduction, Concept technology in E-Commerce, Internet business, Advantage of E-Commerce, Application, Feasibility and constrain.

Subject Name: OBJECT ORIENTED PROGRAMMING USING C++

1. OOP paradigm , Advantages of OOP , Comparison between Functional Programming and OOP approach, characteristics of Object oriented Language objects, Class, Inheritance, Polymorphism, and abstraction, encapsulation, Dynamic Binding, Message passing.
2. Introduction to C++, Identifier and keywords, constants, C++ Operators, Type Conversion, variable declaration, Statement, expressions, User defined data types, Conditional expression (For, While, Do-while) loop statement , breaking control statement (Break, Continue).
3. Defining a function, type of functions, Inline functions, Call by value and Call by reference, Preprocessor, Header files and standard functions, Structures, Pointers and structures, Unions, Enumeration. **Classe**s, Member functions, Objects, Array of objects, Nested classes, Constructors, Copy Constructors, Destructors, Inline member functions, Static class member, friend functions, Dynamic memory allocation.
4. Inheritance: Single inheritance, Multi-level inheritance, hierarchical, Virtual base class, Abstracts classes, Constructors in Derived classes, nesting of classes.
5. Function overloading , Operator overloading, polymorphism, Early binding, Polymorphism with pointers, Virtual functions, Late binding , Pure virtual functions, Opening and closing of files, Stream member function , Binary file operations, Structure and file operations, classes and file operations, Random access file processing.

Subject Name: PRACTICAL

Third Semester

Third Semester			
S. No.	Name of Subject	Credits	Total Marks
1	Foundation Course in Business Entrepreneurship and Management	2	100
2	Computer Networks	5	100
3	Business Communication	4	100
4	Data Structure	5	100
5	Software Project Management	4	100
6	English Literature – I	4	100
Total		24	

Subject Name: FOUNDATION COURSE IN BUSINESS ENTREPRENEURSHIP AND MANAGEMENT

1. **Entrepreneurship:** Concept, value creation, entrepreneurial mindset-innovation and creativity, entrepreneurial decision making-use of biases and heuristics, risk bearing, social and commercial entrepreneurship.
2. **Business:** Concept, types, facilitators and inhibitors of business, role of e-commerce and m-commerce, technological innovation and its viability, ethical considerations.
3. **Market and Society:** Generation and utilization of resources, concept of market, exploring and segmenting the market, demand and supply factors, understanding customer adoption process.
4. **Management:** Concept, function and culture of management, innovation and technology, managing finance, role of incentives and managing human resource.

Subject Name: COMPUTER NETWORKS

1. **Introduction to Computer Networks:** Introduction, User of Networks: Goals and applications, OSI Reference Mode, Novell Netware, ARPANET, NSFNET, And the Internet.
2. **The Physical Layer:** Transmission media, Twisted Pair, Baseband and Broadband Coaxial Cable, Fiber Optics, Wireless Transmission, Radio Transmission, Microwave Transmission, Infrared Transmission, Light Wave Transmission, ISDN Services, Virtual Circuits verses Circuit Switching, Transmission in ATM Network, Paging System, Cordless Telephone, Cellular Telephone, and Communication Satellite.
3. **The Data Link Layer:** The data link Layer, Framing , Error Control, Flow- Control, Error Detection and Correction Protocols, Simplex Stop and Wait Protocols, One Bit sliding Window, Using Go-Back n, the Data link layer in the internet.
4. **The Medium Access Sub – Layer:** The Medium Access Sub Layer , Framing Static and Dynamic Channel Allocation in LAN and MANs ,IEEE standard 802.3 and Ethernet, IEEE standard 802.4 and Token Bus, IEEE 802.4 and Token Ring; Bridges, Bridges form 802x to 802y, Transparent Bridges, Source Routing Bridges.
5. **The Network Layer:** The network layer , network layer Design Issues, shortest Path routing, Flooding, Flow Based Routing , Broadcast Routing, Congestion Control and Prevention Policies,

Internet Working, Connectionless Internet Working , Tunneling Internet Work Routing, Fragmentation, Firewalls, IP Address Internet Control Protocols.

6. **The Transportation Layer:** The transportation Layer, The Transport Service, Transport Protocols, Addressing,, Establishing a Connection, Releasing a Connection, The Internet Transport Protocols, TCP.

7. **The Application Layer:** The Application layer, Network Security, Electronic mail, working of e-mail.

Subject Name: BUSINESS COMMUNICATION

1. **Basics of Communication:** Introduction, Why Communication, Meaning and definition of Communication, Importance of Communication, Elements Of Communication Process, Communication Process Models, Basics Forms Of Communications, Effective Communication.

2. **Communication Theories:** Assumptions about Communication, Communication Theory, Communication Models, Uses of theories and models.

3. **Audience Analysis:** Introduction, Types of Audience, Importance of Audience Analysis, Analyzing Individual and Members of Audience.

4. **Self-Development:** What is self-development, Objectives of self- development, How Self-Development Improves Communication, How Communication Leads to Self-Development, How to Development Oneself.

5. **Developing Positive Attitude:** Impact of Positive Attitude on Communication, How to Develop Positive Thinking.

6. **Corporate Communication:** Corporate Communication, Corporate Communication and Marketing Communication, Types of Corporate Communication.

7. **Formal vs. Informal Communication Network:** Formal Communication Network, Informal Communication.

8. **Barriers to Communication:** Semantic Barriers, Physical Barriers, Organizational Barriers, Psychological Barriers, How to Overcome Communication Barriers.

9. **Practices in Business Communication:** Group Communication, Group Discussion, Seminar, Mock Interview, Presentations, Listening.

10. **The Essentials of Effective Communication:** 7c's of Communication, Other Principles of Communication.

11. **Non Verbal Communication:** Kinesics, Proxemics, Physical Context.

12. **Writing Skill:** Writing Skill, Business Writing, You- Attitude, Steps In Effective Writing.

13. **Letter and Memo Writing: Formats:** Functions of Business Letters, Types of Letters, Parts Of Business Letters, Format Of Business Letters, How to make Business Letters Effective.

14. **Request Letters:** Approaches to request Letters.

15. **Good News Letters:** Purpose of Good news letters, Organization of Good news letters.

16. **Bad News Letters:** What is bad news letter, purpose of writing bad news letters, the right Attitude, Drafting news message.

17. **Persuasive, Sales and Collection Letters:** Types Of Persuasive Letters, Purpose Of Persuasive Letters, How to Persuade Others, Approach to Persuasive letters, Most Common Forms Of Persuasive Letters, Letters Applying Or Offering For Agency.

18. **Memo Writing:** Memo, Memo Format, How to write effective Memos.

19. **Report Writing:** Meaning of Business Report, Types of Reports, Importance of Reports, Essentials of Good Business Report, Steps in Business Report Writing, Structure of Reports.
20. **Speeches and Presentations:** Characteristics of a good speech, How to make Effective Speech, Presentations, Support, Speech, Sales Presentation.
21. **Listening:** Importance of Listening, Types of Listening, and Barriers to effective Listening.
22. **Interviewing Skill:** Types of Interview, Staging and conducting effective interviews, conducting the Interview, Information Gathering Interviews, Selection Interview.
23. **Resumes and Job Application:** Job Application Letters, Writing Solicited Letters, Resume Writing.
24. **Modern Forms of Communication:** Facsimile (FAX), Video Conferencing, Electronic, Electronic Mail (E-Mail).
25. **SWOT Analysis:** SWOT Analysis and Communication, use of SWOT analysis by organizations

Subject Name: DATA STRUCTURE

Unit-I Basic Concepts

1. Fundamental: Data Structures, Algorithms and various types of applications.
2. Basic Data Types: Stack, Lists a7 recursion.

Unit-II Trees & Sets

1. Trees: Definition and implementation of binary tree, tree traversal, postfix, prefix notations, heap.
2. Sets: Definition and Implementation of hash table, priority queues.

Unit-III Algorithms & File Structure

1. Sorting Algorithms : Quick sort, insertion sort, Bubble sort, merge sort
2. Searching Algorithms: Linear search, Binary search, depth first search and Breadth first search techniques.
3. File Structure: Sequential, Index Sequential file Structure.

Subject Name: SOFTWARE PROJECT MANAGEMENT

1. **Introduction:** All Software Engineers Are Created Equal.
2. **Software Project Planning:** Understanding the Project Needs, Write the Vision and Scope Document, Project background, Create the Project Plan, Statement of Work, Resource List, Estimates and project Schedule, Risk Plan, Brainstorm potential risks, Estimate the impact of each risk, Make a mitigation Plan, Diagnosing Project Planning Problems, The Mid-Course Correction, The Detached Engineering Team.
3. **Estimation:** Elements of a Successful Estimate, Assumptions Make Estimates More Accurate, Distrust Can Undermine Estimates, Wideband Delphi Estimation, The Delphi Process, Choosing the team, Kickoff meeting, Individual preparation, Estimation Session, Assemble tasks, Review results, Diagnosing Estimation Problems, Padded Estimates Generate Distrust, Self-Fulfilling Prophecy.

4. **Project Schedules:** Building the project schedule, Allocate Resources to the Tasks, Identify Dependencies, Create the Schedule, Reconcile the Schedule with the Organization's Needs , Add Review Meetings to the Schedule, Optimize the Schedule, Don't Abuse Buffers, Track the Performance of the Project, Managing Multiple Projects, Understand Dependencies Between Projects, Prioritize Projects Realistically, Use the Schedule to Manage Commitments, Diagnosing Scheduling Problems, Misunderstood Predecessors.

5. **Reviews:** Inspections, Choose the Inspection Team, Inspect the Work Product, Desk check, Walkthroughs, Code Reviews, Programming, Use Inspections to Manage Commitments, Diagnosing Review Problems.

6. **Software Requirements:** Requirements Elicitation, Conduct Interview, Use Cases, Software Requirements Specification, Develop the SRS Interactively, Change Control, Introduce Software Requirements Carefully, Diagnosing Software Requirements Problems.

7. **Design and Programming:** Review the design, Version Control with subversion, Refactoring, Unit Testing, Unit, Use Automation, and Be Careful with Existing Projects.

8. **Software Testing:** Test Plans and test cases, Test Execution, Defect Tracking and Triage, Test Environment and Performance Testing, Smoking Tests, Test Automation, Postmortem Reports, Using Software Testing Effectively, Diagnosing Software Testing Problems.

9. **Understanding Change:** Why Change Fails, How to Make Change Succeed.

Subject Name: ENGLISH LITERATURE – I

1. Writing of Indian author
a. Jawaharlal Nehru
b. Dr. R Radhakrishnan
c. Rabindra Nath Tagore
2. Indian Folk Tales Translated by Foreign authors
3. Introduction to Victorian Age of English Literature
4. Play by Shakespeare
5. Famous Poems by English Poets

Fourth Semester

Fourth Semester			
S. No.	**Name of Subject**	**Credits**	**Total Marks**
1	Formal Language and Automata Theory	4	100
2	Data Communication	4	100
3	System Analysis & Design	4	100
4	Financial Accounting	4	100
5	Practical	4	100
Total		**20**	

Subject Name: FORMAL LANGUAGE AND AUTOMATA THEORY

UNIT-I **Fundamentals:** Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and language recognizers.

UNIT-II **Finite Automata:** NFA with ε transitions - Significance, acceptance of languages. Conversions and Equivalence: Equivalence between NFA with and without ε transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSM‟s, Finite Automata with output-Moore and Melay machines.

UNIT-III **Regular Languages:** Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular Expressions, Pumping lemma of regular sets, c losure properties of regular sets (proofs not required)

UNIT-IV **Grammar Formalism:** Regular grammars - right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammer, derivation trees, sent ential forms Rightmost and leftmost derivation of strings.

UNIT-V **Context Free Grammars:** Ambiguity in context free grammars, Minimization of Context Free Grammars, Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages. Enumeration of Properties of CFL (proofs omitted).

UNIT-VI **Push down automata:** Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its eqivalence. Equivalence of CFL and PDA, interconversion. (Proofs not required), introduction to DCFL and DPDA.

UNIT-VII **Turing Machine:** Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Chruch‟s hypothesis, counter machine, types of Turing machines (Proofs not required).

UNIT-VIII **Computability Theory:** Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of problems, Universal Turing Machine, undecidability of posts Correspondence problem, Turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.

Suggested Readings:

1. Hopcroft H.E. & Ullman J.D., „Introduction to Automata Theory Languages and Computation' - Pearson Education

2. Thomson, 'Introduction to theory of computation',-Sipser 2 nd edition
3. Daniel I.A. Cohen, John Wiley, 'Introduction to languages and the Theory of Computation'.
4. John C Martin, 'Introduction to languages and the Theory of Computation' - McGraw Hill.
5. Lewis H.P. & Papadimition 'Elements of Theory of Computation' - C.H. Pearson/PHI.
6. Mishra and Chandrashekaran, 'Theory of computer science - Automata, Languages, and Computation', 2nd edition, PHI

Subject Name: DATA COMMUNICATION

1. Data Communication Concepts

    a. Networks and open system standards: the OSI reference model

    b. Network topologies and the physical layer

        • Bus/Tree topology, ring topology, star topology

    c. The future of data communications

2. Transmission Media and Transmission Technologies

    a. The electrical interface

    b. Metallic media

    c. Optical fiber media

    d. Wireless media (line-of-sight media)

    e. Baseband and broadband transmission

    f. Transmission bandwidth (link capacity)

    g. Codes

    h. Analog and digital signals

    i. Modulation and demodulation, modems and modem standards

    j. Transmission impairments (distortion and noise limitations on system performance)

3. Data Transmission

    a. Transmission modes

        • Simplex, half-duplex, full-duplex communications

        • Serial and parallel transmission

        • Synchronous transmission

        • Asynchronous transmission

    b. Interface standards

    c. Multiplexing of signals

    d. Data compression

4. Protocol Concepts - Media Access Control

    a. Protocol basics

b. MAC protocols (CSMA/CD and Token passing)

5. Data Security and Integrity

   a. Error detection and correction

   b. Encryption and decryption

   c. Viruses, worms, and hacking

6. Local Area Networks

   a. LAN standards (IEEE standards 802 for LANs)

   b. Interconnecting LANs

   c. LAN Hardware (server platforms, backup devices, LAN adapters, printers, etc.)

   d. LAN system software, LAN application software

   e. LAN selection criteria

7. Metropolitan Area Networks (MANs) and Wide Area Networks (WANs)

   a. Network routing

   b. Public data networks

   c. Circuit-switched data network

   d. Packet-switched data network

   e. Internet protocol

   f. ISDN

   g. Electronic mail

8. Network Architecture

   a. Layered approach

   b. Hierarchical approach

9. Network Interconnections (Internetworking)

   a. LAN-to-LAN connections and LAN-to-Host connections

   b. Repeaters, Bridges, Routers, and Gateways

   c. Interconnection utilities

Subject Name: SYSTEM ANALYSIS & DESIGN

1. **System Definition and Concepts:** General Theory systems, Manual and automated systems, Real-life business Sub - Systems. System environment and boundaries. Real - time and distributed systems. Basic principles of successful systems. Approach to system development: Structure system analysis and design, Prototype, Joint application development.

2. **System Analyst:** Role and need of system analyst. Qualifications and responsibilities. System analysis as a profession.

3. **System Development Cycle:** Introduction to Systems Development Life cycle (SDLS). Various phases of SDLS: Study, Analysis, Design, Development, Implementation, Maintenance.

4. **Systems documentation consideration:** Principles of systems documentation, types of documentation and their importance, enforcing documentation discipline in an organization.

5. **System Planning:** Data and fact gathering techniques: Interviews, group Communication - questionnaires, Presentations and visits. Assessing project feasibility: Technical, Operational, Economic, Cost benefits analysis, Schedule, Legal and contractual, Political. Modern methods for determining system requirement: joint application, Development program, prototyping, Business Process re-engineering. System selection plan and proposal.

6. **Modular and Structured Design:** module specifications. Top-down and bottom-up design. Module coupling and cohesion. Structure charts.

7. **System Design and Modeling :** Process modeling , Logical and Physical design Conceptual Data modeling Entity- relationship analysis, Entity -relationship modeling, ERDs and DFDs, Concepts of normalization. Process description: Structured English, Decision tree, Decision tables. Documentation: Data dictionary, Recording data

8. **Input and Output:** Classification of forms, Input/output forms design. User-interface design, Graphical interfaces. Standards and guideline for GUI design. Designing physical files and databases: Designing field, Designing physical record, Designing Physical files, Designing database. Introduction to CASE tools, Feature, Advantages and Limitations of CASE tools, Awareness about some commercial CASE tools.

9. **System Implementation and Maintenance:** Planning consideration Conversion methods, Procedures and Controls. System acceptance criteria. System evaluation and performance. Testing and Validation. Preparing user manual .Maintenance activities and issues.

10. **Computer System Audit and Security:** Audit of Computer system usage. Types of threats to computer system control measures: Threat and risk analysis, Disaster recovery and contingency planning, viruses.

11. **OO Analysis/ Design:** Introduction to UML OO development life cycle and modeling .Static and dynamic modeling. Comparison of OO and module-oriented approach. Modeling using UML.

12. **Introduction to Management Information System (MIS):** Meaning and role of MIS. System approach to MIS. Types of information systems: Transaction processing system, Management information system Decision support system, Expert system case studies (Illustrative): MIS for accounting and function, MIS for marketing system.

Subject Name: FINANCIAL ACCOUNTING

1. **Meaning and Objective of Accounting:** Meaning &Process, Primary Objectives, Basic Terms.
2. **Theory Base of Accounting:** Basic Assumptions, Basic Principles, Modifying Principles.
3. **Accounting Equation:** Meaning, Process for Development and Accounting Equation.
4. **Journalizing, Posting and Balancing:** Traditional Classification, Accounting Equation Based Classification, Rules of Debit, Credit & Journal Ledger, Posting, Balancing.
5. **Subsidiary Book I-Cash Book:** Meaning & Advantage s of Special Journals, Cash Book.
6. **Subsidiary Book II-Cash Books:** Purchases Book, Sales Book journal proper.

7. **Depreciation, Reserves and Provision:** Meaning, Causes, Factors of Depreciation & Accounting, Methods of Allocating & Recording Depreciation, Meaning & Objectives of Provision.

8. **Financial Statement :** Meaning & Usefulness , F.S , Trading Account , Manufacturing Account, profit and Loss Account, Balance Sheet, Final Accounts Classification of Capital and Revenue.

9. **Consignment of Accounts:** Meaning Terms Accounting Entries in the Books Consignor.

10. **Accounting for joint venture:** Meaning Methods of Recording joint and Separate Venture Transactions, Recording in the Books of Books Of One Co-ventureer only, All Co- venturers.

11. **Accounting for Non-profit Seeking Organizations:** Meaning Distinction Between profit and Non-profit Seeking Organization Receipts& Payment Account Income and Expenditure Account, Meaning and Accounting Treatment of Some Peculiar Items, Preparation of a Receipts& Payment Account.

12. **Accounts form incomplete records:** Meaning Reasons and Limitation of incomplete records, Preparation of Accounts, Final Accounts Method, Hints for Tracing Missing Information.

13. **Accounting for Partnership Firms-Fundamentals :** Meaning Essential Elements and Nature of a partnership, Partnership Deed, Maintaining Capital Account of Partners, Treatment of Interest on Capital Calculation of Interest on Capital & Drawings, Calculation of Commission to a Partner, Division of Profit among partners, Goodwill .

14. **Accounting for Partnership firms-Retirement/Death of Partner:** New profit sharing ration and gaining ration, Treatment of Goodwill, Adjustment for reserves and Accumulated Profit/Losses, Adjustment of Capitals, Disposal of the amount due to the retiring partner.

15. **Partnership-Dissolution of firm :** Dissolution of Partnership Vs. Dissolution of a firm , Settlement of Accounts (Section 48), Treatment of firm's debts and private debts(Sec.49), Realization Account, Accounting Entries.

16. **Final Account of a Company:** Meaning, Distinction between a company's and firm's Balance sheets.

Subject Name: PRACTICAL

Fifth Semester

S. No.	Name of Subject	Credits	Total Marks
\- Fifth Semester			
1	Moral & Value Education	2	100
2	Multimedia Technology	5	100
3	Web Technology	6	100
4	Client Server Technology	6	100
5	English Literature – II	5	100
Total		**24**	

Subject Name: MORAL & VALUE EDUCATION

1. **Introduction:** Nature and Sources of the Problem, Existing Values Education Initiatives. Purpose.
2. **Conceptual framework:** The National Mandate for Morals and Values Education. The Philosophy of Education. The Goals of Education.
3. **Morals and Values Education:** Nature and Scope. The Moral Angle. Limitations.
4. **Implications:** The Role of the School. The Role of Teachers" Colleges. Social Action Groups. Community Groups.

Subject Name: MULTIMEDIA TECHNOLOGY

Unit-I

Introduction and Hardware:

Definition Of Multimedia, CD-ROMs and Multimedia applications, Multimedia requirements – Hardware, Software, Creativity and Organization, Multimedia skills and training Macintosh Verses PC, the Macintosh platform, PC platform, Connections, Memory and storage devices, input devices, Output hardware ,Communication devices.

Unit-II

Multimedia Software:

Basic tools, painting and drawing tools, OCR software, Sound editing programs, Animation devices and digital movies and other accessories, Linking multimedia objects , Office suites, word processor, spreadsheets presentation tools, Types of Authoring tools card and page based, icon based and time based authoring tools, Object oriented tools.

Unit-III

Production Building Blocks:

Test-Using test in Multimedia, Computers and Text, Font editing and design tools, Hypertext, Sounds-multimedia system sounds MIDI Verses Digital Audio, Audio file Formats, Working with sound in Windows, Notation interchange file format (NIFF),Adding sound.

Unit-IV

Production Tips:

Image-Creation, making still images, images colors, Images, File format, Animation-principles of animations, making workable animations Video, using video, Broadcast Video, Standard, Integrating Computer and TVs, Shooting and editing Video, Using Recording formats, Video tips, Video Compression.

Unit-V

Multimedia Project Development and case Studies:

Project planning, Estimating, RPFs and Bid proposals, Designing, Producing acquiring and using contents, Using Telnet, Testing, Preparing for delivery , CD-ROM Technology and Standards. Designing for the Word Wide, Working on the Web, Text for the Web, Images for the Web, and Animation for the Web.

Subject Name: WEB TECHNOLOGY

1. **Current Trends on Internet:** Languages, Internet Phone, Internet Video, Collaborative Computing, e-commerce.
2. **Web Publishing and Browsing:** Overview SGML ,web hosting, HTML,CGL Documents interchange Standards, Components of web Publishing, Documents management, Web page Design, Consideration and Principles, Search and Meta Search Engines, WWW, Browser, HTTP, Publishing Tools.
3. **Interactivity Tools:** ASP, VB Script, Java Script, JAVA, Front Page and Flash.
4. **Internet Security Management Concepts, Information Privacy and Copyright Issues:** Overview of Internet Security, Firewall, Internet Security, Management Concepts and information Privacy and Copyright issues, Basics of Asymmetric Cryptosystems.

Subject Name: CLIENT SERVER TECHNOLOGY

1. **Introduction:** Client Server Technology, Evolution of Architectures, Thin Characteristics, General Issues In Client-Server Computing, Overview Oracle Distributed Database System, Other Issues in Client-Server Computing Development, Applying Client/Server In Businesses.
2. **Client-Server Technology and Heterogeneous Computing:** Categories of Clients, Clients/Server Systems, the Role of the Server, Single-System Image, Client/Server Software Architectures-an Overview, Technical Detail, Mainframe-Centric Client/Server Computing, Client Server Development Tools Samson Kifle Is, Client/Server Development Tools.
3. **The Evolution of Client/Server Computing and Architectures:** Tier Architectures, Tier Architectures-Tier Architectures.
4. **Interaction of Client and Server Communication Techniques and Protocols:** Network, Network Structure, Protocol, Hardware, Cabling, Topology, Star Network Operating Sys Tem Software. **Distributed Systems:** Distributed System Model.
5. **UNIX Client Server Technology:** Understanding the Role of UNIX, General Overview and Structure, UNIX Components, Impact/Contributions.
6. **Database Management Systems:** What is database management systems ,Peoples who deals with database, Overall system structure ,Cgdp's 12 rules'' fdr a fully relations DBMS, The role of DBA in dbms, pl/sql, operators, Fundamental SQL commands, Data definition command of sql, program, is null operator, Alter table ,Aggregate functions ,Controls structure ,introduction to stored procedures.
7. **Basic UNIX and Shell Programming:** Unix Operating System ,History Of Unix, Features Of Unix ,Kernel, Process Managements ,File Systems ,Unix ,Kernel, Process Managements ,File System, Unix Commands, Files &Directories ,General Purpose Utilities, Compression Utilities ,Processes ,She 11Phoqw.
8. **CPU/Process Scheduling:** Goals of Scheduling (objectives) ,Preemptive Vs N On Preemptive Scheduling
9. **Unit-10-Memory Management:** Memory Management, Principles of Virtual Management, Memory, Memory Management in MS-DOS.

Subject Name: ENGLISH LITERATURE – II

1. Place of Literature in Arts
2. Famous Literatures

- Chaucer
- Shakespeare
- Milton
- Bacon
- Byron
- Shelley
- Keats
- Dryden
3. Brief Introduction of Famous Writers
4. Indian Poetess: Toru Dutta
5. Contribution of Great Scientist

Sixth Semester

Sixth Semester			
S. No.	Name of Subject	Credits	Total Marks
1	Visual Basic	5	100
2	Computer Graphics	5	100
3	Software Engineering	5	100
4	Project	5	100
Total		**20**	

Subject Name: VISUAL BASIC

1. **Introduction to Visual Basics:** Object-Oriented Programming (OOP), What Is the Visual Basic ?, Visual Basic Application, Introduction to Visual Basic , Event-Driven Programming, Integrated Development Environment(IDE), Toolbox, Form Layout Window, Properties Window, Menu Bar, Immediate Window, Creating the interface, Resizing, Moving , and Locking Controls, To Lock all Control Positions, To Adjust the Position of Locked Controls, Setting Properties, Designing a form, Saving the Project, Working with Multiple Projects, Merging Text, Using Wizard and Add-Ins, Using Wizards, Making and Running an Executable File Adding Controls, OLE, Command Button.

2. **Data Types in Visual Basics:** Data Type, Operator, Precedence of Operators, Arrays.

3. **Controls Statements in Visual Basic:** Introduction to Control Statements, Decision Structures or Selection Statements, More Worked Out Programming Examples.

4. **Standards Library Functions in Visual Basics:** Introduction, Characters and Strings, String Data Types, Concatenation of Strings, Concatenation Operator (& Operator), Arithmetic Operators, String Functions, Numeric Functions, Date, Time and Now Functions, Date Arithmetic Functions (Date Add,, Data Diff), Data Type Functions, Arithmetic Functions, Remainder.

5. **Visual Basic Forms, Procedures and Functions:** Introduction, to Forms, Single Documents Interface (SDI), Multiple Document Interface (MDI), Managing Projects, Using Procedures and Functions, Procedures, Calling Sub Procedures, Calling Function Procedures, Passing Arguments to Procedures, Using Optional Arguments.

Subject Name: COMPUTER GRAPHICS

1. Keyboard, Touch Panel, Light pens, Graphic tablets, Joysticks, Touch balls, Image scanner, Mouse, Handy copy device:-Zero impact and Non-Impact printers, Dot matrix, Laser printer, Inkjet printer, Dectrostate, Flatted and drum plotters. Video display devise:-Cathode Rey tube, Resistance, Resolution ,Aspect ratio vertical and horizontal ,Color CRT monitors, Direct view storage tube, Flat panel displays, LCD Virtual reality, Faster scan system, Random scan system. Memory device:-Memory (RAM, ROM), CD, Floppy disk, Magnetic tapes, Magnetic disks.

2. Scan conversion algorithm for line (DDA & Bresenham's algorithm) ,Midpoint circle ,Circle & ellipse, Midpoint ellipse, Midpoint ellipse ,Bresenham's algorithm ,Area filling techniques, Scan line polygene fill, Boundary fill character generation.2-dimensional Graphics: Cartesian & Homogeneous coordinate system, Geometric   transformations, Affine   transformation (Translation, Scaling ,Rotation, Reflection, Shearing),Composite transformation ,Affine Viewing pipeline, Two dimensional viewing transformation and clipping(Line, Polygon and Text).

3. Three Dimensional Graphics:-Geometric transformation (Translation, Scaling, rotation, reflection, shearing), Composite transformations, Mathematics of projections (parallel & perspective), View pipeline, 3D viewing transformations and clipping (normalized view volumes, view port, clipping).

4. Hidden line and surface elimination algorithms, Z-buffer, Scan-line, Sub-division, and Painter's algorithm. Illumination Models: Diffuse reflection, specular reflection, refracted light, Texture surface patterns, half toning, dithering. Surface rendering methods: Constant intensity method, Gourmand shading, Hong shading. Color Model: Introduction to RGB, CMY & HSV color models.

Subject Name: SOFTWARE ENGINEERING

1. The Software Problem
2. Software Process
3. Software Requirements Analysis and Specification
4. Software Architecture
5. Planning a software project
6. Design
7. Coding and Unit Testing
8. Testing

Subject Name: PROJECT

Procedure for Admission:

Student may collect the information regarding admission through University website or helpdesk number according to their convenience. Student can download the admission form from the University website and send directly through online or offline mode to the University. After scrutinizing the documents and clearance of fees the admission will be confirmed and Registration/ Enrolment number will be issued.

Fees Structure:

Sr.no	Particular	Fees
1	Course Fees	16,000/-
2	Credit Transfer/ Lateral Entry	1000/-
3	Continuation Fees	1000/-
4	Examination Fees	200/- (Per Paper)
5	Reappear/ Revaluation Fees	300/- (Per Paper)

In case of any scholarship applicable as per the UGC norms or any other statutory body, the admission committee will discuss the same and issue the appropriate decision accordingly.

The Examination will be conducted in Online/ Offline mode. The Evaluation will be done by the Internal Evaluators as well as External Evaluators.

The Result will be declared on the website of Centre for Distance & Online Education. After declaration of result student will be asked to submit re-evaluation form (if any) within 15 days of declaration of result.

Requirement of the Laboratory:

The University is going to use the ICT (Information Communication Technology) for conducting the programme. In case of any programme required practical to be conducted either the same will be performed by applying virtual reality methods or in offline mode at the University campus/ associated colleges. Also, the student will be provided a practical hand book for their help and better understanding.

Every Student would be provided SLM material in printed form. Also, the same will be available online on the University website.

Cost Estimate of the Programme:

The estimated cost would be Rs.4,00,000/- for programme development, delivery and maintenance.

CENTRE FOR DISTANCE &
ONLINE EDUCATION

ARUNACHAL
UNIVERSITY
OF STUDIES

State Education & Skill Self-Sponsored University

Quality Assurance:

Every year the curriculum of the course will be reviewed and forwarded to the Academic Council with suggestions. The Academic Council will discuss the suggestions and recommended to Board of Management for its approval. The changes in the course curriculum as per the needs and requirements from time to time. The University will help the passed-out students in their placement in different industries through their training and placement cell.