

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

## SCHEME OF TEACHING & EXAMINATION

### III Sem. MCA

S.NO	Board of Study	Subject Code	SUBJECT	Periods Per Week			Scheme of Exam			Total Marks	Credits L+(T+P)/2
				L	T	P	Theory / Practical				
							ESC	CT	TA		
1	Computer Applications	521311(21)	Computer Networks and Communication	4	1	0	100	20	20	140	5
2	Applied Maths	521312(14)	Computer Oriented Optimization	4	1	0	100	20	20	140	5
3	Computer Applications	521313(21)	Formal Languages & Automata Theory	4	1	0	100	20	20	140	5
4	Computer Applications	521314(21)	Information System - Analysis, Design and Implementation	4	1	0	100	20	20	140	5
5	Computer Applications	521315(21)	Object Oriented Methodology and C++	4	1	0	100	20	20	140	5
6	Computer Applications	521321(21)	Programming Lab in C++	0	0	4	50	–	25	75	2
7	Computer Applications	521322(21)	Visual Programming Lab	0	0	4	75	–	25	100	2
8	Computer Applications	521323(21)	Project -I	0	0	5	75	–	25	100	3
9	Humanities etc.	521324(46)	Personality Development	0	0	2	–	–	25	25	1
<b>TOTAL</b>				<b>20</b>	<b>5</b>	<b>15</b>	<b>700</b>	<b>100</b>	<b>200</b>	<b>1000</b>	<b>33</b>

ESE: End Semester Examination    CT: Class Test    TA: Teacher's Assessment    L: Lecture    T: Tutorial    P: Practical

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: MCA 3<sup>rd</sup> Sem.

Subject : Computer Networks & Communication

Total Theory Periods : 40

Total Marks in End Semester Exam : 100

Minimum no. of class tests to be conducted : 2

Branch : Computer Applications

Code : 521311(21)

Total Tut Periods : 10

- UNIT-1 Introduction:** Layered Network Architecture, Review of ISO- OSI Model, Introduction to TCP/IP Model.; Data Communication Techniques: Pulse Code Modulation (PCM), Differential Pulse Code Modulation (DPCM), Delta Modulation (DM).; Multiplexing Techniques: Frequency Division, Time Division, Statistical Time Division Multiplexing.; Physical Layer: Transmission Media: Wires, Cables, Radio Links, Satellite Link, Fiber Optic.; Error Detection And Correction: Single and Burst Error, Parity Check Codes, Cyclic Redundancy Code & Hamming Code.
- UNIT-2 Data Link Layer Protocols:** Stop and Wait Protocols: Noise free and Noisy channels, performance and efficiency., Sliding Window Protocols: Go Back and Selective Repeat ARQS, performance and Efficiency, verification of protocol., HDLC and ATM: HDLC data link protocol, ISDN, Channel Structure, Asynchronous Transfer Mode (ATM), ATM cells, Header and Cell Formats. Layers in ATM class 1,2,3,4, traffic.
- UNIT-3 Medium Access Control Sub layer:** Concept of Random Access, Pure ALOHA throughput characteristics of ALOHA Throughputs for finite and infinite populations S-ALOHA., LAN :IEEE 802.3, 802.4 and 802.5 Protocols performance of Ethernet. Token Ring Protocol, FDDI Protocol, Distributed Queue Dual Bus (DQDB) Protocol.
- UNIT -4 Network And Transport Layer Protocols:** General Principles, **Virtual circuits and datagrams**, Windows Flow Control, Packet Discarding, Traffic Shaping, Choke RSVP, Network Layer in ATM, Internetworking using Bridges, Routers and Gateways, Routing Algorithms: **Optimality principle, shortest path routing-Dijkstra, Flooding and broadcasting, distance vector routing, link state routing, flow based routing, Multicasting routing flow and congestion control.** Internet Architecture and addressing. Transport Layer: Design issues, Quality of Services, Primitives Connection Management: Addressing, Connection Establishment and Releases. Flow control and Buffering, crash recovery, Element of TCP/IP protocol: *User Data gram Protocol*, (UDP/TCP) Layering,
- UNIT -5 Presentation And Application Layer Protocols:** Presentation concepts SNMP Abstract Syntax notation. I (ASN-I)., Cryptography: Substitution and Transposition, ciphers, Data Encryption Standard (DES), DES Chaining, Breaking DES, Public key Cryptography, Authentication Protocols.

Text Books:

1. A.S. Tanenbaum " Computer Network: Second Ed. Prentice Hall, India(tan)
2. B.A .Frouzan, Data Communication , Tata Mc Graw Hill.

Reference Books:

1. D. Berekas an R. Gallager, " Data Networks", second Ed. Prentice Hall, India
- 2 D.E. Coner, " Intertworking with TCP/IP", Vol-I.Prentice Hall India.
3. G.E. Keiser, " Local Area Networks", McGraw Hill, International Ed.
4. W. Stalling, "Data & Computer Communications", Maxwell Macmillan Internation Ed.

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**CHHATTISGARH SWAMI VEVEKANAND TECHNICAL UNIVERSITY  
BHILAI (C.G.)**

Semester : MCA 3<sup>rd</sup> Sem.  
Sub: **Computer Oriented Optimization**  
Total Theory Periods : 40  
Total marks in End Semester Exam : 100  
Minimum number of class test to be conducted : 02

Branch : Computer Application  
Code : 521312 (14)  
Total Tutorial Periods : 10

**UNIT –1 LINEAR PROGRAMMING**

(No. of periods 8+2)

LP formulations, Graphical method for solving LP with 2 variables, Simplex method, Application of simplex method for maximization and minimization of LP problems, Artificial variable technique for finding the initial basic feasible solution, The Big-M method, Two phase method, Degeneracy in simplex method, Duality theory in LP, Dual simplex method.

**UNIT-2 TRANSPORTATION MODEL**

(No. of periods 8+2)

North – West corner rule, Least cost method, Vogel's Approximation method, Modi method, Assignment problem, Dynamic Programming: Basic concepts, Bellman's optimality principle, Dynamic programming approach in decision making, Optimal subdivision problem.

**UNIT- 3 INVENTORY MODELS**

(No. of periods 8+2)

Introduction to the inventory problem, Deterministic models, The classical EOQ (Economic order quantity) model, Purchasing model with no shortage, Manufacturing model with no shortage, purchasing model with shortage, Manufacturing model with shortage, Inventory models with probabilistic demand.

**UNIT –4 SEQUENCING AND QUEUING THEORY**

(No. of periods 8+2)

Sequencing problem, Johnson's algorithm for processing N-jobs through 2 machine problem, N-jobs through 3 machine problem, 2- job through N machine by graphical method, Characteristics of queuing system- steady state M/M/1, M/M/1K and M/M/C queuing models.

**UNIT-5 CPM and PERT**

(No. of periods 8+2)

Arrow network, Time estimates – Earliest expected time, Latest allowable occurrence time and slack, Critical path, Probability of meeting scheduled date of completion of project, Calculation on CPM network, Various floats for activities, Critical Path, Updating project, Operation time cost trade off curve & project time cost trade off curve, selection of schedule based on cost analysis.

**TEXT BOOKS:-**

1. B.E. Gillet Introduction to Operations Research, A Computer Oriented Algorithmic Approach – Tata Mc Grow Hill publishing Co. Ltd. New York.
2. P.K. Gupta & D.S. Hira, Operations Research, S. Chand & Co.

**REFERENCE BOOKS:-**

1. J.K. Sharma "Operation Research" Theory and Applications" Mac Millan
2. H.A. Taha, Operations Research – An Introduction, Fifth Edition, Mac Millan publishing Co. Ltd. New York.
3. S.D. Sharma "Operations Research, Kedar Nath, Ram Nath, Mecrut.
4. Kanti Swarup, Operations Research, S. Chand & Sons.

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: MCA 3<sup>rd</sup> Sem.

Branch : Computer Applications

Subject : Formal Languages & Automata Theory

Code : 521313(21)

Total Theory Periods : 40

Total Tut Periods : 10

Total Marks in End Semester Exam : 100

Minimum no. of class tests to be conducted : 2

- UNIT-1** Review of mathematical preliminaries, Relations, functions, set theory, predicate and propositional calculus, principle of mathematical induction/strong mathematical induction.
- UNIT-2** Formal Languages, Phrase structured grammar and their classification, Chomsky hierarchy, closure properties of families of languages, regular grammar, properties of regular sets, finite automata NFA, DFA & 2DFA, FSM with output, Determinism and Non determinism, FA minimization and related theorems.
- UNIT-3** Context free grammar and their properties, derivation tree, simplifying CFG, unambiguifying CFG, CNF and GNF of CFG, push down automata, Two way PDA, relation of PDA with CFG, Determinism and Non determinism in PDA and related theorems.
- UNIT-4** Concept of Linear Bounded Automata, context sensitive grammars and their equivalence; Unrestricted grammars and their equivalence with TM, determinism and non determinism in TM, TM as acceptor/generator/algorithms and related theorems, Multi tape, multi track TM, automata with two push down store and related theorems.
- UNIT-5** Introduction to Complexity theory. Introduction to recursive function theory, Recursively enumerable sets, recursive sets, partial recursive sets, Russell's paradox, Church's hypothesis, post correspondence problem, undecidability and some non-computable problems.

## Name of Text Books:

- (1) Hopcroft and Ullman: Introduction to automata theory, Languages & Computation, Narosha Publication house.
- (2) Mishra & Chandrashekharan: Theory of Computer Science, Automata Languages & computation, 2<sup>nd</sup> Ed PHI, New Delhi.

## Name of Reference Books:

- (1) Lewish Papadimitra: Theory of Computation, Prentice hall of India, New Delhi
- (2) Liu C.L.: Elements of Discrete Mathematics, Mc Graw Hill.
- (3) Hopcroft, Rajeev Motwani and Ullman: Introduction to Automata theory, languages and computation.

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: MCA 3<sup>rd</sup> Sem.

Branch : Computer Applications

Subject : **Information System- Analysis, Design and Implementation**

Code : 521314(21)

Total Theory Periods : 40

Total Tut Periods : 10

Total Marks in End Semester Exam : 100

Minimum no. of class tests to be conducted : 2

- UNIT-1 **Introduction:** System concepts, Classification of the system, system control, Management Structure, Information Concepts, Qualities of Information and their implications, type of information, Examples of Information Systems, role of system analyst, System Development life cycle (SDLC).
- UNIT -2 **Information Gathering and Feasibility study:** System Requirement Specification, Information system planning and initial investigation, Information Sources, Various information gathering tools, Feasibility Study, Cost-Benefit Analysis, Feasibility Report.
- UNIT -3 **Analysis, Design and Testing:** Conventional & structured tools of system analysis, Data Flow Diagrams, Decision Table, Various methods of process design, Form design methodologies, Object Oriented system modeling : Objects & their properties, Implementation of classes, identifying Objects in an Application, Modeling system with Objects.
- UNIT -4 **Security Disaster/ Recovery and Ethics in System Development:** Introduction to information system testing, System Security, Threats to System Security, Control Measures, Quality Assurance security and Disaster management, Ethics in System Development
- UNIT -5 **Introduction to MIS:** Long range planning, development & implementation of an MIS, Quality control in MIS, applications of MIS in manufacturing sectors and in service sector. Decision support. system (DSS) concepts, type of DSS, Knowledge based expert system (KBES), overview of enterprises resource planning (ERP).

## **Text Books:**

1. System Analysis & Design, by A wad E. M., Galotis Publications
2. Analysis and Design of Information System by V. Rajaraman, PHI Publication

## **Reference Books:**

- 1 Management Information System, by W. S. Jawadkar, THM Publication, India
2. MIS concepts & Design, by Murdic R. G. , Munson, Prentice Hall.
3. Management Information System, O. Brien James, Galotia 1998

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: MCA 3<sup>rd</sup> Sem.

Branch : Computer Applications

Subject : **Object Oriented Methodology & C ++** Code : 521315(21)

Total Theory Periods : 40

Total Tut Periods : 10

Total Marks in End Semester Exam : 100

Minimum no. of class tests to be conducted : 2

**UNIT-1 C++ Basics:** Data hiding , Encapsulation , Data abstraction. loops and decisions, structures and functions, object and classes, Scope of class and its member , Nested Class, object arrays, Pointers ,Constructor: parameterized constructor, multiple constructor, default constructor, copy constructor, implicit constructor , destructor function, Dynamic allocation operators :new(),delete().

**UNIT-2 Friend function, Friend class, inline functions., Function overloading , Operator Overloading** : Unary, Binary., Inheritance: Single inheritance, multilevel inheritance, Hierarchical inheritance, Hybrid Inheritance, Multiple inheritance.

**UNIT-3** Virtual base classes, pointers to base and derived classes, virtual functions, early and late binding, templates, exception handling.

**UNIT-4** C++ I/O system, formatted I/O, creating insertors and extractors, file I/O basis, creating disk files Working with file : files & streams, opening & closing a file, read() & write() functions, Detecting end-of-file. File manipulation using seekg(), tellg(), tellp() functions

**UNIT-5** Object model, OOD and OOA, abstraction, encapsulation, modularity, hierarchy, state, behaviour and relationship among objects. Objects oriented design, identifying classes and object., object diagrams

## **Name of Text Books:**

- (1) K.R.Venugopal, Raj Kumar & T.Ravi Shankar : Mastering C++ ,TMH pub.
- (2) H. Schildt :C++ complete reference, TMH pub.

## **Reference Books:**

- (1) Balaguruswami: Object Oriented Programming with C++
- (2) Robert Lafore: Object Oriented Programming in Turbo C++ , Galgotia Pub.
- (3) Grady Booch: Object Oriented Analysis & Design , Pearson.
- (4) Stephen Prata: C++ Primer plus, Galgotia Pub.
- (5) Bjarne Stroustrup: The C++ Programming language , Pearson

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: MCA 3<sup>rd</sup> Sem.

Branch : Computer Applications

Subject: **Programming Lab in C++**

Practical Code : 521321(21)

Total Practical Periods : 36

Total Marks in End Semester Exam : 50

## **Experiments to be performed: (minimum 10 experiments)**

- (i) Write a program to define a class Book that will contain Title, Author and Price of the book as data members. Define Null constructor, Parameterized constructor and copy constructor for the class and a function to display the details of an object. Use the new operator to initialize object of this class through a pointer and display the data member through a member function.
- (ii) Write a program to define two classes Alpha and Beta containing an integer each as data members. Define a function Sum( ) that will be a friend to both Alpha and Beta ,that will take one object from each class as argument and return the sum of the data members of the argument objects.
- (iii) Write a program to define a class Sample containing a static data member count that will maintain the total number of objects of this class initialized so far.
- (iv) Write a Program to define a class Complex that will contain real and imaginary as the data members. Define appropriate constructors and a display function. Overload the binary + and the \* operator to add and multiply two complex numbers respectively.
- (v) Write a program to define a class time that will represent a time period in minutes and seconds. Define member functions and overload the following operators for the following:
  - ++ Operator that will increment the seconds by 1
  - + Operator that will add two objects of time class
- (vi) Write a program to define a class Array that will contain an array of integers as a private data member of the class. Overload the subscript operator [ ] so that it will take an integer index as an argument and return the reference of element at that index in the array.
- (vii) Write a program to overload the comma operator for a class such that for the instruction a = ( b,c ) the larger object of 'c' and 'b' is assigned to 'a'.
- (viii) Write a program to define a class Base that will contain a protected integer data member and inherit this class in class called Derived. Override the display function of Base class and add a new member function in the Derived class so that it returns the factorial of the Base class member.
- (ix) Write a program to define a class Two dimensional that will represent a point in the plane by its x and y coordinates. The class will contain constructors and member function that can calculate the distance between any two points in the plane. Derive a new class Three dimensional from the class Two dimensional that will add a new member, the z coordinate. Override the function that calculates distance so that it can calculate the distance between two points in the space.
- (x) Write a program to define an abstract class Person that will contain the essential information like name, age and sex of a person. Now derive two classes Student and Employee both from the

class Person. The class Student will contain the academic information such as roll number; school etc. and the class Employee will contain information such as department and salary. In the main function declare and array of Person pointers that can hold the address of either Student or Employee object. The program will ask the user to enter the details of Students/Employees, create dynamic objects of these classes using new operator and store them in the array. The program will then display the contents of these objects.

- (xi) Write a program to read the contents of a text file and count the number of characters read from the file.
- (xii) Write a program that will ask the user to input a file name and copy the contents of that file into another file.
- (xiii) Write a program that will ask the user to enter the details of 5 students and transfer those details into a binary file Stud.dat. Write another file that will read the details of the students and print the names of all those students who have total marks greater than a particular given value.
- (xiv) Write a program that will take the details of 10 students as input and transfer it into a binary file. Write another program that will provide a menu to the user for the following purposes:
  - To display details of all the students
  - To display details of all the students having total marks greater than a given value
  - To sort the file on the basis of Roll number of students
  - To sort the file on the basis of Total marks of students
  - To update the record for a particular student
  - To delete the record for a particular student
  - To search the details of a particular student on the basis of Roll number or Name
- (xv) Write a program that will take any number of integers from the command line as argument and print the sum of all those integers.

**List of Equipments/Machine required :**

- (i) PC with Windows xp
- (ii) Turbo C++ compiler

**Recommended Books :**

- (i) K.R.Venugopal, Raj Kumar & T.Ravi Shankar : Mastering C++ ,TMH pub.
- (ii) H. Schildt :C++ complete reference, TMH pub.

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: MCA 3<sup>rd</sup> Sem.

Subject: **Visual Programming Lab**

Total Practical Periods : 36

Total Marks in End Semester Exam : 75

Branch : Computer Applications

Practical Code : 521322(21)

## **Experiments to be Performed: (minimum 10 experiments)**

- (i) To design and code a form using given toolbox options
- (ii) To Design and code a Mark sheet.
- (iii) Design and code the employees' details to generate a pay- slip format.
- (iv) Make a sample program to display and change the color according to the scrollbar value
- (v) Generate a sample program to display a bill for the book shop
- (vi) Design and code the program to demonstrate the slider and status bar
- (vii) Employee details and a sample format to generate a railway reservation ticket using Database.
- (viii) Generate a sample notepad using Rich text box
- (ix) With a database generate a chart using the Microsoft chart control 6.0
- (x) Display the form with grid which shows the contents of a database using the Microsoft Data grid control 6.0
- (xi) Generate a tabbed display of the contents using the Microsoft tabbed dialog control 6.0
- (xii) To design a form with the toolbar, menubar.
- (xiii) A program to select and play with the help of Microsoft common dialog control 6.0 and windows media player.
- (xiv) To create a Active X component with the Active X control project.
- (xv) To Generate a Quiz program.

## Text Books:

- 1 .Visual Basic Project ,Soma Dasgupta , BPB publication.
2. Visual Basic ,Black book,Holzner
3. Mastering Visual Basic

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# Chhattisgarh Swami Vivekanand Technical University, Bilai

Semester: MCA 3<sup>rd</sup> Sem.

Subject: Project 1

Total Practical Periods : 5

Total Marks in End Semester Exam : 75

Branch : Computer Applications

Practical Code : 521323 (21)

## **Project- 1**

1. Project should be made using front-end tools with database.
2. Database should be normalized up to 3 NF.
3. The concept of System Analysis and design should be implemented.
4. Project report should be submitted.

## CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

**Semester :** MCA 3<sup>rd</sup> Sem.

**Subject :** Personality Development

No. of Periods : 2 pds/week

Total Marks in End Semester Exam. : NIL

Minimum number of class tests to be conducted : Two

**Branch :** Computer Applications

Code : 521324 (46)

Tutorial Periods : NIL

Teacher's Assessment : 40 Mks

**Objective:** The course is introduced to develop one's outer and inner personality tremendously and enrich the abilities to enable one to meet the challenges associated with different job levels. Personality Development is essential for overall development of an individual apart from gaining technical knowledge in the subject.

### Unit – I

#### Personality concepts:

- **What is Personality** – its physical and psychic aspects. How to develop a positive self-image. How to aim at Excellence. How to apply the cosmic laws that govern life and personality.
- **How to improve Memory.** How to develop successful learning skills. How to develop and effectively use one's creative power.
- How to apply the **individual MOTIVATORS** that make you a self-power personality.

### Unit – II

#### Interpersonal Skills:

- **Leadership:** Leaders who make a difference, Leadership: your idea, What do we know about leadership? If you are serious about Excellence. Concepts of leadership, Two important keys to effective leadership, Principles of leadership, Factors of leadership, Attributes.
- **Listening:** Listening skills, How to listen, Saying a lot- just by listening, The words and the music, How to talk to a disturbed person, Listening and sometimes challenging.
- **How to win friends** and influence people, How to get along with others. How to develop art of convincing others. How can one make the difference. How to deal with others particularly elders. Conflicts and cooperation.

### Unit – III

#### Attitudinal Changes:

- **Meaning of attitude,** benefits of positive attitudes, how to develop the habit of positive thinking.
- **Negative attitude and wining:** What is FEAR and how to win it. How to win loneliness. How to win over FAILURE. How to win over PAIN. How to win over one's ANGER and others anger. How to overcome CRITICISM. What is stress and how to cope up with it? What is crisis and how to manage it.
- How to apply the **character MOTIVATORS** that elevate you and your personality to the top, the art of self motivation.
- How to acquire **mental well-being.**
- How to acquire **physical well-being.**
- How to formulate effective **success philosophy.**

## Unit –IV

### Decision Making:

How to make your own LUCK. How to plan goals/objectives and action plan to achieve them. How to make RIGHT DECISION and overcome problems. How to make a Decision. Decision making : A question of style. Which style, when ? People decisions : The key decisions. What do we know about group decision making ? General aids towards improving group decision making. More tips for decisions of importance.

## Unit – V

### Communication Skills:

- **Public Speaking:** Importance of Public speaking for professionals. The art of Speaking - Forget the fear of presentation, Symptoms of stage fear, Main reason for speech failure, Stop failures by acquiring Information; Preparation & designing of speech, Skills to impress in public speaking & Conversation, Use of presentation aids & media.
- **Study & Examination:** How to tackle examination, How to develop successful study skills.
- **Group discussions:** Purpose of GD, What factors contribute to group worthiness, Roles to be played in GD.

### Reference Books:

1. How to develop a pleasing personality by Atul John Rego, Better yourself books, Mumbai, 2000.
2. How to Succeed by Brain Adams, Better Yourself books, Mumbai, 1969.
3. Basic Managerial skills for all by E. H McGrawth, Prentice Hall India Pvt Ltd, 2006.
4. The powerful Personality by Dr Ujjawal Patni & Dr Pratap Deshmukh, Medident Publisher, 2006.
5. Great Words win Hearts by Dr Ujjwal Patni, Fusion Books, 2006.
6. Personality : Classic Theories & Modern Research; friedman ; Pearson Education 2006.
7. How to win friends and influence people by Dale Carnigie, A.H. Wheeler 2006.