

Bachelor of Science – Information Technology

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Programme Structure

Curriculum & Scheme of Examination

2015

AMITY UNIVERSITY CHHATTISGARH

RAIPUR

B.Sc. – Information Technology

Programme Structure

SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
IFT2201	Introduction to Object Oriented Programming & C++	2	-	-	2
IFT2202	Introduction to Database Management Systems	2	-	-	2
IFT2203	Visual Basic	2	-	-	2
IFT2204	Computer Oriented Numerical Analysis	2	-	-	2
IFT2205	Networking for Home & Small Business	2	-	-	2
IFT2206	Oracle Lab	-	-	2	1
IFT2207	Introduction to Object Oriented Programming & C++ Lab	-	-	2	1
IFT2208	Visual Basic Lab	-	-	2	1
IFT2209	Networking for Home & Small Business Lab	-	-	2	1
Open Electives					6*+3
CSS2251	Presentation Skills*	1	-	-	3
BEH2251	Problem Solving & Creative Thinking*	1	-	-	1
LAN2251	Foreign Language – II*	2	-	-	2
LAN2252	French - II				
LAN2253	German - II				
LAN2254	Spanish - II				
LAN2255	Russian - II				
LAN2256	Chinese - II				
LAN2257	Portuguese –II				
LAN2258	Korean-II				
LAN2258	Japanese-II				
TOTAL					23

SUMMER PROJECT - I

Syllabus – Second Semester

INTRODUCTION TO OBJECT ORIENTED PROGRAMMING AND C++

Course Code: IFT2201

Credit Units: 02

Course Objective:

C++ is one of the most widely used programming languages for solving problems. The objective of this course is to provide object oriented programming fundamentals using C++. Topics to be covered include fundamentals of syntax & semantics of C++, loops & decisions, functions, classes and structures and features of classes such as overloading and inheritance, files, streams, pointers etc.

Course Contents:

Module I: Overview of C++

What is Object Oriented Programming, Characteristics of OOP, Difference between C and C++. Basics:-Input/Output in C++ using cin/cout, Preprocessor Directives, Data Types-Integer, Float, character, Enumerated data types, library functions, comments, storage classes, manipulators, type conversion, arithmetic operators, arrays and strings

Module II: Classes and objects

Functions: Simple functions, passing arguments to functions, returning values from functions, reference arguments, returning by reference, Overloaded functions, Inline functions, Structures, defining the structure variable, accessing members of structure, accessing structure members using pointers

Classes and objects: A simple class, C++ objects as physical objects, objects as function arguments, returning objects from functions, static class data, array as class data member, array of objects.

Module III: Inheritance

Inheritance, Types of Inheritance, access modes – public, private & protected, Abstract Classes, Ambiguity resolution using scope resolution operator and Virtual base class, Constructors, Destructors, copy constructor, Dynamic constructor

Module IV: Polymorphism

Polymorphism, Type of Polymorphism – Compile time and runtime, Function Overloading, Operator Overloading (Unary and Binary) Polymorphism by parameter, Pointer to objects, this pointer, Virtual Functions, pure virtual functions.

Module V: Files and Exception Handling and I/O

Files and Streams: streams, string I/O, character I/O, file pointer, error handling, command line arguments.

formatted and Unformatted Input output. Exception Handling: Try catch block, rethrowing exception.

Examination Scheme:

Components	CT1	PR.	ATTD.	EE
Weightage (%)	10	15	5	70

Text & References:

- ☐ Programming with C++, Ravi Chandran
- ☐ Mastering C++, Venugopal
- Programming in C++, SCHAUM's series
- ☐ The complete reference C++, Herbert Schildt
- ☐ Turbo C++, Robert Lafore

INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS

Course Code: IFT2202

Credit Units: 02

Course Objective:

The objective of this course is to expose the students to the fundamentals & basic concepts in Data Base Management Systems. This course discusses architecture of Database Systems with concept of relational model & ER model. This course explains techniques for database design, Normalization and database recovery and protection.

Course Contents:

Module I: Introduction to DBMS

Definition of DBMS, Data Independence, DBMS Architecture, Levels, Database Administrator, File System Approach Vs DBMS Approach, Advantages of Using a DBMS, Data Models , Schemas, and Instances.

Module II: Relational Database & ER Model

Relational System, Codd's Rule, Relational Model, Optimization, Tables and Views, Entity, Types of Entity, Weak Entity Attributes , Entity sets , Entity – Relationship Diagrams.

Module III: Relational Model Objects

Domains and Relations, Relations and predicates, Relational Data Integrity ; Primary Key, Candidate Key , Foreign Key and their rules; Relational operators, Relational Algebra, Relational Calculus, SQL Language, Data definition, Data retrieval and update operations.

Module IV: Database Design

Definition Of Functional Dependencies, Process Of Normalization, First Normal Form, Second Normal Form, Third Normal Form. Boycee Codd Normal Form, Fourth Normal Form, Fifth Normal Form.

Module V: Data Recovery & Protection

Recovery-Transaction recovery, System recovery, Media Recovery, Concurrency Control Techniques, Locking, Dead Lock, Serializability;
Security - Introduction.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	10	15	5	70

Text & References:

- Elmasari, Navathe, “Fundamentals of Database Systems”, Addison Wesley.
- Korth, Silbertz, Sudarshan, “Database Concepts”. McGraw Hill.
- Majumdar & Bhattacharya, “Database Management System”, Tata McGraw Hill.
- Date C J.” An Introduction to Database Systems”, Addison Wesley.

VISUAL BASIC

Course Code: IFT2203

Credit Units: 02

Course Objective:

This course is aimed to provide a fundamental understanding of Visual Programming Environment for the students in their early stages of academic career. Various concepts regarding GUI such as Manipulating GUI Tools like Command Buttons, Checkboxes, Combo boxes, etc. through Programming in a Visual Environment will be introduced for students to develop a Healthy Programming attitude towards new and emerging Technologies in the field of Visual Programming. After this course, you will be able to understand fundamental concepts of Visual Programming and development of various GUI applications.

Course Contents:

Module I: Introduction to Visual Basic

Introduction, CUI, GUI, Why Visual Programming, Different Visual Programming Languages, Initial Screens, Different applications, Starting a new project, MDI and SDI, Variables and constants, Data Types, Scope of variables, Operators, Forms, Basic Controls (Text box, Labels, Command buttons, Image Control, Picture box), Properties, Methods and Events, Message Box, Input Box, Feature of VB, Event Driven Programming.

Module II: Controlling Program Flow

Determinate and Indeterminate Loops, Making Decisions, Select Case, Nested If-Then, Go to.

Module III: Some More Controls

Option Button, Check Boxes, List and Combo and Boxes, Timers, Scroll bars.

Module IV: Arrays, Function and Procedure

Arrays, Control arrays, Sub procedure, Functions, Built in functions, collections, Event: Mouse Event, Keyboard Events.

Module V: Menus and dialog boxes

Menus, Pop-up Menu, Toolbars, Image list control, Status bar control.

Module VI: Additional Controls

File List Box, Directory List Box, Drive List Box.

Module VII: File Handling

File Commands, Sequential Files, Random Access Files, Binary Files.

Module VIII: Introduction to Database handling

Introduction, Database access methods, DAO, ADO, RDO, Database handling through ADO, SQL.

Examination Scheme:

Components	CT1	PR.	ATTD.	EE
Weightage (%)	10	15	5	70

Text & References:

Text:

- ☐ Visual Basic 6 from Ground Up, Gary Cornell, TMH Publication.
- ☐ Visual Basic 6 Programming Black book, Steven Holzner, Wiley India.

References:

- ☐ Mastering Visual Basic, PHI.

COMPUTER ORIENTED NUMERICAL ANALYSIS

Course Code: IFT2204

Credit Units: 02

Course Objective:

This course is aimed to provide a fundamental understanding of Computer Oriented Numerical Analysis for the students in their early stages of academic career. Several concepts such as Solution of Linear Algebraic Equations, Solution of Algebraic and Transcendental equations, Interpolation, Curve fitting, etc. will be introduced to students. After this course, you will be able to understand fundamental concepts of Numerical Analysis, which will prove highly beneficial to them in understanding more complicated topics of computer science.

Course Contents:

Module I: Introduction

Introduction to Numerical Analysis, Application Area of N.A., Numbers and Their Accuracy, Mathematical, preliminaries, Error Analysis, Absolute, Relative, Truncation and Rounding Error.

Module II: Solution of Algebraic and Transcendental Equations

Introduction, Bisection Method, regular False Method, Iteration Method, Newton Raphson Method, Generalized Secant Raphson Method.

Module III: Interpolation and Curve Fitting

Basic Definition, Forward Differences, backward Differences, Central Differences, Newton Forward Differences Formula, Newton's Divided Difference Formula, Lagrange's Method. Curve Fitting Techniques

Module IV: Numerical Difference & Integration

Numerical Differentiation based on Interpolation Formula, Numerical Integration, Trapezoidal Rules, Simpson's 1/3 rule, Simpson's 3/8 Rule

Module V: Numerical Solution to ODE

Basic Definition, Taylor Series Method, Euler's Method, Modified Euler's Method, Runge Kutta Method

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	10	15	5	70

Text & References:

Text:

- ☐ Numerical Analysis V. Raja Raman
- ☐ Numerical Methods by B.S. Grewal

References:

- ☐ Numerical Solutions M.K. Jain & R.K. Jain

NETWORKING FOR HOME AND SMALL BUSINESS

Course Code: IFT2205

Credit Units: 02

Course Objective:

This course is aimed to provide a fundamental understanding of Computer Networking, Operating System, Connecting to the networks, network addressing, network services and Wireless technologies etc. After the completion of the course you will understand the core concepts around which computer networks revolve.

Course Contents:

Module I: Connecting to the Networks

Introduction to Networking, Principles of Communication, Communicating on a Local Wired Network, Building the Access Layer of an Ethernet Network, Building the Distribution Layer of Network, Plan and Connect a Local Network, Clients/Servers and Their Interactions, Application Protocols and Services, Layered Model and Protocols.

Module II: Connecting to the Internet through ISP & Network Addressing

The Internet and How We Connect To It Sending Information across the Internet, Addresses and Subnet Masks, Types of IP Addresses, How IP Addresses are obtained
Address Management

Module III: Wireless Technologies

Wireless Technology, Wireless LANs, Security Considerations on a Wireless LAN
Configuring an Integrated AP and Wireless Client

Module IV: Basic Security

Networking Threats, Methods of attack, Security Policy, Using Firewalls.

Module V: Trouble Shooting your Network

Troubleshooting Process, Troubleshooting Issues, Common Issues, Troubleshooting and the Helpdesk

Examination Scheme:

Components	CT1	PR.	ATTD.	EE
Weightage (%)	10	15	5	70

Text & References:

Text:

- ☐ CCNA-Discovery 4.0, module 1, Cisco Certified Networking Academy

References:

- ☐ Data Communication and Computer Network, Forozoun, TMH Publication
- ☐ Data Communication and Network, Stallings, PHI
- ☐ Computer Network, Tanenbaum, PHI

ORACLE LAB

Course Code: IFT2206

Credit Units: 01

Course Contents:

Module I: Introduction to oracle

Tools of Oracle, Features of oracle.

- 1) Create a table “PRODUCTS” with the below mentioned structure:

Product ID	NUMBER(11)
Supplier ID	NUMBER(11)
Category ID	NUMBER(11)
Quantity Per Unit	VARCHAR2(20)
Unit Price	NUMBER(11)
Units In Stock	NUMBER(11)
Units On Order	NUMBER(11)

Product ID should be the Primary Key.

Module II: SQL

Overview of SQL, Component of SQL (DDL, DML, DCL), Advantage of SQL, Basics of syntax writing, Data Definition Language, Create command, Data type, Constraints, ALTER & DROP, UPDATE & DELETE Commands, Substitutions variables, Run time Environments variables, SELECT Commands Basic Constructs, Functions, Nested Queries, Correlated queries, Views, Sequence, Synonymous, User Management Commands.

- 2) Consider the following tables:

WORKS(Pname,Cname,Salary)
LIVES(Pname,Street,City)
LOCATED_IN(Cname,City)
MANAGER(Pname,Mgrname)

Where Pname=Person name, Cname= Company name and Mgrname = Manager name.

Write the SQL for the following:

- List the names of the people who work for the company Wipro along with the cities they live in.
 - Find the people who work for the company “Infosys” with a salary more than Rs. 50000/-.
List the names of the people , along with the street and city addresses.
 - Find the names of the persons who live and work in the same city.
 - Find the names of the persons who did not work for “Infosys”.
 - Find the persons whose salaries are more than that of all of the “Oracle” employees.
 - Find the names of the companies that are located in every city where the company “Infosys” is located.
- 3) Create table EMP and DEPT with the below mentioned structure
Structure for EMP table

EmpID	NUMBER(4)
DeptID	VARCHAR2(10)
EmpName	CHAR(10)
Job	CHAR(10)
HireDate	DATE
Salary	NUMBER(7, 2)
Commission	NUMBER (7, 2)

Structure for DEPT table

DeptId	VARCHAR2(10)
Deptname	VARCHAR2(20)

No_of_Faculties NUMBER(2)

In table EMP : EmpID should be the Primary Key and DeptID should be the foreign key.

In table DEPT : DeptId should be the primary key.

- 4) INSERT the following values in the EMP table:
 - a) 1001,SET_01,Harrey,SE,01-Jan-2009,15000,3
 - b) 1002,SET_02, Ron, SSE,15-Feb-1998,20000,4
 - c) 1003,SEM_05, Peter, Manager,15-April-1999,40000,5
 - d) 1002,SED_07, Jolie,Assistant Manager,15-Dec-1998,50000,5
 - e) 1008,SET_08, Santy, SSE,15-Feb-2000,20000,4
 - f) 1008,SED_10, San, SE,10-Feb-2009,22000,5
- 5) Considering the above table i.e EMP write the queries for the following:
 - a) Find out the number of employees having “manager” as job.
 - b) Display only the jobs with maximum salary greater than or equal to 3000
 - c) Find all those employees whose job does not start with „M“.
 - d) Find the names of the employees whose name starts with „S“.
 - e) Find the names of the employees who are Managers and their date of joining is after “02-Jan-2006”.
 - f) For describing the structure of the EMP table and DEPT table.
 - g) For getting the average salary of the employees from EMP table.
 - h) For displaying the current date and give the column a name “DATE”.
 - i) For converting the name of the employee into uppercase where the employee name is “Santy”
 - j) Create a sequence with name SEQ_EMP , which will generate numbers from 1 to 99 in ascending order with an interval of 1. The sequence must start from 1 after generating the number 99.
 - k) Displaying the names of the employees who have an a and an e in their names.
- 6) Considering the table DEPT in question 3, find the total number of departments.
- 7) Alter the EMP table for the changing the width of the field EmpID from 4 to 10.
- 8) Alter the DEPT table for changing the width of the field No_of_Faculties from 2 to 4.
- 9) Delete all the records from the EMP table where the EmpName starts with “S”,
- 10) Insert some values in the PRODUCTS table created in Question 1 and then DROP the table PRODUCTS.
- 11) Update the EMP table for the following values:
 - a) Increase the salary of all the employees by 10% where the job is SE and SSE.
 - b) Change the hiredate of the employee “Harry” to 01-Feb-2009.
 - c) Update the salary of the employees to an increase of 15% where deptid is SED_07.
- 12) Alter the table EMP for the following:
 - a) Add one more field in the table i.e DOB DATE
 - b) Drop the column named Commission from the EMP table.
- 13) Write a query to select all the records from the EMP table.
- 14) Write a query to select all the records from the DEPT table.
- 15) Write a query to select the distinct deptid from EMP table.
- 16) Write a query to find the name and salary of the employee from EMP table where the salary is maximum.

17) Create a view named v_EMP on the table EMP,DEPT by selecting the following fields

Emp ID, Dept ID, Emp Name, Job

Where the EMP.Dept ID = DEPT. Dept Id.

18) Create a synonym S_EMP on the table EMP.

Module III

Basic features, Block Structure of a PL/SQL Programs, Control Structures, Exception Handling, Cursor, Procedure, function and Triggers, Internet features of Oracle, Overviews of SQLJ

19) Write a PL/SQL program for:

- a) Printing the Fibonacci series from 1 to 50.
- b) Printing the smallest number among any three numbers.
- c) Printing the table of any specific number entered.

20) Create a trigger named "Client_Master" which keeps track of records deleted or updated when such operations are carried out. Records in this table are inserted into table "Audit" when database trigger fires due to an update or delete statement fired on this table "Client".

Table: Client

Column name	Data type	Size
Client_no	Varchar2	6
Name	Varchar2	20
Address	Varchar2	30
Balance_Due	Number	10,2

21) Write a sql query to drop the table EMP, can we drop a table with data in it.

Examination Scheme:

Components	CT1	PR.	ATTD.	EE
Weightage (%)	10	15	5	70

Text & References:

- SQL, PL/SQL Ivan Bayross BPB Publication

INTRODUCTION TO OBJECT ORIENTED PROGRAMMING AND C++ LAB

Course Code: IFT2207

Credit Units: 01

Course Contents:

1. WAP to calculate factorial of a given number n.
2. WAP to do the following:
 - a. Generate the following menu:
 1. Add two numbers.
 2. Subtract two numbers.
 3. Multiply two numbers.
 4. Divide two numbers.
 5. Exit.
 - b. Ask the user to input two integers and then input a choice from the menu. Perform all the arithmetic operations which have been offered by the menu. Checks for errors caused due to inappropriate entry by user and output a statement accordingly.
3. WAP to read a set of numbers in an array & to find the largest of them.
4. WAP to exchange contents of two variables using call by value.
5. WAP to exchange contents of two variables using call by reference.
6. Calculate area of different geometrical figures (circle, rectangle, square, triangle) using function overloading.
7. WAP to add two complex numbers using friend function.
8. WAP to maintain the student record which contains Roll number, Name, Marks1, Marks2, Marks3 as data member and getdata(), display() and setdata() as member functions.
9. WAP to increment the employee salaries on the basis of there designation (Manager-5000, General Manager-10000, CEO-20000, worker-2000). Use employee name, id, designation and salary as data member and inc_sal as member function (Use array of object).
10. Write a class bank, containing data member: Name of Depositor, A/c type, Type of A/c, Balance amount. Member function: To assign initial value, To deposit an amount, to withdraw an amount after checking the balance (which should be greater than Rs. 500) , To display name & balance.
11. WAP to define nested class „student_info“ which contains data members such as name, roll number and sex and also consists of one more class „date“ ,whose data members are day, month and year. The data is to be read from the keyboard & displayed on the screen.
12. WAP to generate a series of Fibonacci numbers using copy constructor, where it is defined outside the class using scope resolution operator.
13. Write a class string to compare two strings, overload (=) operator.
14. Write a class to concatenate two strings, overload (+) operator.
15. Create a class item, having two data members x & y, overload „-“, (unary operator) to change the sign of x and y.
16. Create a class Employee. Derive 3 classes from this class namely, Programmer, Analyst & Project Leader. Take attributes and operations on your own. WAP to implement this with array of pointers.
17. Create two classes namely Employee and Qualification. Using multiple inheritance derive two classes Scientist and Manager. Take suitable attributes & operations. WAP to implement this class hierarchy.
18. WAP to read data from keyboard & write it to the file. After writing is completed, the file is closed. The program again opens the same file and reads it.
19. WAP to creat a class student containing Name & class as parameters, create another class marks which inherit student class taking own data members as mark1 & mark2 & show result.

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

VISUAL BASIC LAB

Course Code: IFT2208

Credit Units: 01

Course Contents:

1. Write a program to calculate simple interest.
2. Write a program to calculate factorial of a given number.
3. Create a project for book sales. Make text boxes for quantity, title and price with labels. Calculate total price, discount (15%) and discounted price. Make command buttons for calculate, clear and exit.
4. Write a program to create login form.
5. Create a project that contains a form for entering book information from controls.
 - Text boxes for author and title.
 - Option button for type fiction or non-fiction.
 - Dropdown list for subject that will include bestseller, fantasy, religion, romance, humor, science fiction, business, philosophy, education, self-help and mystery.
 - List box for shelf no. containing RC-111, RC-112, RC-113, and RC-114.
 - Use command buttons display, clear and exit.
 - Use labels to display information.
6. Create a list box, which contains names of all cinema halls of NCR. If you choose name of cinema hall, label display information regarding all movies running in the cinema halls.
7. Create a project that contains student's information
 - Text boxes to display name and courses.
 - Option buttons for semester/ year.
 - Use list boxes for computers, business, humanities, Commerce, medical and engineering.
 - A simple combo for name of college.
 - Display information on a label.
 - Make command buttons for display, clear and exit.
8. Write a program to check whether the number is even or odd.
9. Write a program function to generate Fibonacci Series.
10. Create a calculator using control array.
11. Write a program, to check whether a given number is prime number or not.
12. Write a program to generate first 10 prime numbers.
13. Write a program, to check whether a given string is palindrome or not.
14. Write a program to enter elements of an array in list box and update them by incrementing or decrementing them by 10 and store the results in other list.
15. Write a program to search an element in an array, using Linear Search.
16. Write a program to search an element in an array, using Binary Search.
17. Write a program to concatenate two strings.
18. Write a program to calculate the sum of the digits of a given no. and also reverse the no.
19. Write a program to create a Pop Up Menu.
20. Design a project that has multiple forms, such that form1 is welcome form, form2 Contains personal details and form3 contains professional information and form4 display both personal as well as professional information of an employee.
21. Design a project for a MDI application, such that child1 contains no menu and child2 contains menu. With this demonstrate working of an MDI form.

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.
Design a project for University database having fields student Roll No, Name, Class, Address, Marks, Allow Add, Delete, and navigation to the database.

NETWORKING FOR HOME AND SMALL BUSINESS LAB

Course Code: IFT2209

Credit Units: 01

Course Contents:

1. Building a peer to peer Network.
2. Determine MAC address of host .
3. Determine ip address of a computer.
4. IP addresses and Network Communication.
5. Sharing the resources among Network Computers.
6. Tracing internet. connectivity
7. Using Windows calculator with Network addresses
8. Observing DNS name Resolution.
9. Configuring an Email Clint.
10. Troubleshooting physical connectivity.
11. Basics of packet tracer interface overview.
12. Creating a Network topology using packet tracer.
13. Clustering a Network topology using packet tracer.
14. Configuring devices using config. Tab in packet tracer.
15. Navigating & modifying physical work space using packet tracer.

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.