Raja N. L. Khan Women's College (Autonomous)

Syllabus For B.Sc. (Honours) Computer Science

under

National Education Policy (NEP)

w.e.f 2023

Level	SEM	Course Type	Course Code	Course Title	Credit	L-T-P	Marks		
							CA	ESE	TOTAL
				SEMESTER-I					
		Major-1	**COSHMJ101**	**T: Programming in C/C++**	4	3-0-1	15	60	75
				P: Programming in C/C++ Lab					
		SEC	**COSSEC01**	**T: Computing Paradigm with Python Programming**	3	0-0-3	10	40	50
				P: Python Programming Lab					
		AEC	**AEC01**	**Communicative English - 1 (Common for all Courses)**	2	2-0-0	10	40	50
B.Sc. (Hons.)	I	MDC	**MDC01**	**Multidisciplinary Course -1 (Environmental Studies)**	3	3-0-0	10	40	50
		VAC -1	**VAC01**	**Value Added Course-01 Physical Fitness and Community Service**	2	2-0-2	50	50	50
		VAC -2	**VAC02**	**Value Added Course-02 Mental Health and Well Being**	2	2-0-2	50	50	50
		Minor-I	**COSMI01**	**T: Computer Fundamentals (To be taken by students of other Disciplines)**	4	3-0-1	15	60	75
				P: Office Tools					
		CS		**Community Service Report 50 viva-voce-25**	4	0-0-4			75
									425
		Semester-I Total			24				

SEM	Course Type	Course Code	Course Title	Credit	L-T-P	Marks		
						CA	ESE	TOTAL
			SEMESTER-II					
	Major-1I	**COSHMJ102**	**T: Digital Electronics**	4	3-0-1	15	60	75
			P: Digital Electronics Lab					
	SEC 02	**COSSEC02**	**T: HTML Programming**	3	0-0-3	10	40	50
			P: HTML Programming Lab					
	AEC	**AEC02**	**MIL (Modern Indian Language)**	2	2-0-0	10	40	50
	MDC	**MDC02**	**Multidisciplinary Course -2 (Digital Literacy & Artificial Intelligence)**	3	3-0-0	10	40	50
	VAC -1	**VAC03**	**Value Added Course-03**	2	2-0-2	50	50	50
	VAC -2	**VAC04**	**Value Added Course-04**	2	2-0-2	50	50	50
	Minor-II	**COSMI02**	**T:Information Technology & C programming (To be taken by students of other Disciplines)**	4	3-0-1	15	60	75
			P:Office Tools					
	Semester-II Total			20				400

Level	SEM	Course Type	Course Code	Course Title	Credit	L-T-P	Marks		
							CA	ESE	TOTAL
				SEMESTER-III					
		Major-III	**COSHMJ301**	Data structure	4	3-0-1	15	60	75
				Data structure Lab					
		Major-IV	**COSHMJ302**	Programming in JAVA	4	3-0-1	15	60	75
				Programming in JAVA Lab					
		SEC -3	**COSSEC03**	Programming in MATLAB	3	0-0-3	10	40	50
				Programming in MATLAB Lab					
B.Sc. (Hons.)	**III**	**AEC**	**AEC03**	**Communicative English -1 (Common for all Courses)**	2	2-0-0	10	40	50
		MDC	**MDC03**	**Digital Fluency & Artificial Intelligence**	3	3-0-0	10	40	50
		Minor-I	**COSMI02**	Data Structure	4	3-0-1	15	60	75
				Data structure Lab					
									475
		Semester-III Total			20				

Level	SEM	Course Type	Course Code	Course Title	Credit	L-T-P	Marks		
							CA	ESE	TOTAL
B.Sc. (Hons.)	IV	**SEMESTER-IV**							
		Major-V	COSMJ401	Computer organization and Architecture	4	3-0-1	15	60	75
				Computer Architecture Lab					
		Major-VI	COSMJ402	Operating Systems	4	3-0-1	15	60	75
				Operating Systems Lab					
		Major-VII	COSMJ403	Data Communications & Computer Networks	4	3-0-1	15	60	75
				Data Communications & Computer Networks Lab					
			MIL	MIL	2		10	40	50
		CS		Community Service	2		10	40	50
		Minor-III	**COSMI02**	Physics/ Biotechnology	4	3-0-1	15	60	75
									400
		Semester-IV Total			20				

Level	SEM	Course Type	Course Code	Course Title	Credit	L-T-P	Marks		
							CA	ESE	TOTAL
			SEMESTER-V						
		Major-VIII	COSMJ501	Design and Analysis of Algorithms	4	3-0-1	15	60	75
				Design and Analysis of Algorithms Lab					
		Major-IX	COSMJ502	Software Engineering	4	3-0-1	15	60	75
				Software Engineering Lab					
B.Sc. (Hons.)	V	Major-X	COSMJ503	Database Management System	4	3-0-1	15	60	75
				Database Management System Lab					
		Major-XI	COSMJ504	Discrete Structures	4	3-0-1	15	60	75
		Minor-III	COSMI03	Physics/ Economics/Biotechnology	4	3-0-1	15	60	75
									375
		Semester-V Total			20				

Level	SEM	Course Type	Course Code	Course Title	Credit	L-T-P	Marks		
							CA	ESE	TOTAL

SEMESTER-VI

Major-XII	COSMJ601	Machine Learning	4	3-0-1	15	60	75
		Machine Learning Lab					
Major-XIII	COSMJ602	Theory of Computation	4	4-0-0	10	60	75
Major-XIV	COSMJ603	Computer Graphics	4	3-0-1	15	60	75
		Computer Graphics Lab					
Major-XV	COSMJ604	Project- Minor	4	0-0-4	5	70	75
		Summer Internship	2				50
Minor-IV	COSMI04	Physics /Biotechnology	4	3-0-1	15	60	75
Semester-VI Total			22				425

Major-1 (COSHMJ101):

<mark>**Programming Fundamentals using C/C++**</mark>

Illustrate the flowchart and design an algorithm for a given problem to develop a c programs using operators.
o Develop conditional and iterative statements to write c programs.
 o Exercise user defined functions to solve real time problems.
o Inscribe c programs that use pointers to access arrays
strings and functions.
o Exercise user defined datatypes including structures and unions to solve problems.
 o Inscribe c programs using pointers and to allocate memory using dynamic memory management functions.
o Exercise files concept to show input and output of files in c

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Theory: 60 Lectures

1. Introduction to CandC++   **(3 Lectures)**

History of C and C++, Overview of Procedural Programming and Object-Orientation Programming, Using main() function, Compiling and Executing Simple Programs in C++.

2. **Data Types, Variables, Constants, Operators andBasicI/O**   **(5 Lectures)**

Declaring, Defining and Initializing Variables, Scope of Variables, Using Named Constants, Keywords, Data Types, Casting of Data Types, Operators (Arithmetic, Logical and Bitwise), Using Comments in programs, Character I/O (getc, getchar, putc, putcharetc), Formatted and Console I/O (printf(), scanf(), cin, cout), Using Basic Header Files (stdio.h, iostream.h,conio.hetc).

3. **Expressions, Conditional Statements and Iterative Statements**   **(5 Lectures)**

Simple Expressions in C++ (including Unary Operator Expressions, Binary Operator Expressions), Understanding Operators Precedence in Expressions, Conditional Statements (if construct, switch-case construct), Understanding syntax and utility of Iterative Statements (while, do-while, and for loops), Use of break and continue in Loops, Using Nested Statements (Conditional as well as Iterative)

4. **Functions and Arrays**   **(10Lectures)**

Utility of functions, Call by Value, Call by Reference, Functions returning value, Void functions, Inline Functions, Return data type of functions, Functions parameters, Differentiating between Declaration and Definition of Functions, Command Line Arguments/Parameters in Functions, Functions with variable number of Arguments.

Creating and Using One Dimensional Arrays (Declaring and Defining an Array, Initializing an Array, Accessing individual elements in an Array, Manipulating

array elements using loops), Use Various types of arrays (integer, float and character arrays / Strings) Two- dimensional Arrays (Declaring, Defining and Initializing Two Dimensional Array, Working with Rows and Columns), Introduction to Multi-dimensional arrays

5. **Derived Data Types (Structures and Unions)**   **(3 Lectures)**

Understanding utility of structures and unions, Declaring, initializing and using simple structures and unions, Manipulating individual members of structures and unions, Array of Structures, Individual data members as structures, Passing and returning structures from functions, Structure with union as members, Union with structures as members.

6. **Pointers and References in C++**   **(7 Lectures)**

Understanding a Pointer Variable, Simple use of Pointers (Declaring and Dereferencing Pointers to simple variables), Pointers to Pointers, Pointers to structures, Problems with pointers, Passing pointers as function arguments, Returning a pointer from a function, using arrays as pointers, Passing arrays to functions. Pointers vs. References, Declaring and initializing references, Using references as function arguments and function return values

7. **Memory Allocation in C++**   **(3 Lectures)**

Differentiating between static and dynamic memory allocation, use of malloc, calloc and free functions, use of new and delete operators, storage of variables in static and dynamic memory allocation

8. **File I/O,Preprocessor Directives (4 Lectures)**

Opening and closing a file (use of fstream header file, ifstream, ofstream and fstream classes), Reading and writing Text Files, Using put(), get(), read() and write() functions, Random access in files, Understanding the Preprocessor Directives (#include, #define, #error, #if,#else, #elif, #endif, #ifdef, #ifndef and #undef),Macros

9. **Using Classes in C++**   **(7 Lectures)**

Principles of Object-Oriented Programming, Defining & Using Classes, Class Constructors, Constructor Overloading, Function overloading in classes, Class Variables &Functions, Objects as parameters, Specifying the Protected and Private Access, Copy Constructors,Overview of Template classes and their use.

10. **Overview of Function Overloading and Operator Overloading (5 Lectures)**

Need of Overloading functions and operators, Overloading functions by number and type of arguments, Looking at an operator as a function call, Overloading Operators (including assignment operators, unary operators)

11. Inheritance, Polymorphism and Exception Handling   (8 Lectures)

Introduction to Inheritance (Multi-Level Inheritance, Multiple Inheritance), Polymorphism (Virtual Functions, Pure Virtual Functions), Basics Exceptional Handling (using catch and throw, multiple catch statements), Catching all exceptions, Restricting exceptions, Rethrowing exceptions.

Reference Books

1. HerbtzSchildt, "C++: The Complete Reference", Fourth Edition, McGrawHill.2003

2. BjarneStroustrup, "The C++ Programming Language", 4th Edition, Addison-Wesley ,2013.

3. BjarneStroustroup, "Programming -- Principles and Practice using C++", 2nd Edition, Addison-Wesley2014.

4. E Balaguruswamy, "Object Oriented Programming with C++", Tata McGraw-Hill Education,2008.

5. Paul Deitel, Harvey Deitel, "C++ How to Program", 8th Edition, Prentice Hall,2011.

5. John R. Hubbard, "Programming with C++", Schaum's Series, 2nd Edition,2000.

6. Andrew Koeni, Barbara, E. Moo, "Accelerated C++", Published by Addison-Wesley ,2000.

7. Scott Meyers, "Effective C++", 3rd Edition, Published by Addison-Wesley,2005.

8. Harry, H. Chaudhary, "Head First C++ Programming: The Definitive Beginner's Guide", First Create space Inc, O-D Publishing, LLCUSA.2014

9. Walter Savitch, "Problem Solving with C++", Pearson Education,2007.

Stanley B. Lippman, JoseeLajoie, Barbara E. Moo, "C++ Primer", Published by Addison- Wesley, 5th Edition,2012

Programming Fundamentals using C/C++ Lab
(Using GCC/Visual C++ compiler)
Practical: 60 Lectures

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1. WAP to print the sum and product of digits of aninteger.

2. WAP to reverse anumber.

3. WAP to compute the sum of the first n terms of the
    following series S =1+1/2+1/3+1/4+……

4. WAP to compute the sum of the first n terms of the
    following series S=1-2+3-4+5…………….

5. Write a function that checks whether a given string is Palindrome or not.
Use this function to find whether the string entered by user is Palindrome
ornot.

6. Write a function to find whether a given no. is prime or not. Use the same to
generate the prime numbers less than100.

7.WAP to compute the factors of a givennumber.

8. Write a macro that swaps two numbers. WAP to useit.

9. WAP to print a triangle of stars as follows (take number of lines fromuser):

```
        *
       ***
      *****
     *******
    *********
```

10. WAP to perform following actions on an array entered by theuser:
    i) Print the even-valuedelements
    ii) Print the odd-valuedelements
    iii) Calculate and print the sum and average of the elements ofarray
    iv) Print the maximum and minimum element ofarray
    v) Remove the duplicates from thearray
    vi) Print the array in reverseorder

    The program should present a menu to the user and ask for one of the
    options. The menu should also include options to re-enter array and to
    quit the program.

11. WAP that prints a table indicating the number of occurrences of each
alphabet in the text entered as command line arguments.

12. Write a program that swaps two numbers usingpointers.

13. Write a program in which a function is passed address of two variables and then alter its contents.

14. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main()function.

15. Write a program to find sum of n elements entered by the user. To write this program, allocate memory dynamically using malloc() / calloc() functions or newoperator.

16. Write a menu driven program to perform following operations onstrings:

    a) Show address of each character instring
    b) Concatenate two strings without using strcatfunction.
    c) Concatenate two strings using strcatfunction.
    d) Compare twostrings
    e) Calculate length of the string (usepointers)
    f) Convert all lowercase characters touppercase
    g) Convert all uppercase characters tolowercase
    h) Calculate number ofvowels
    i) Reverse thestring

17. Given two ordered arrays of integers, write a program to merge the two-arrays to get an orderedarray.

18. WAP to display Fibonacci series (i)using recursion, (ii) usingiteration

19. WAP to calculate Factorial of a number (i)using recursion, (ii) usingiteration

20. WAP to calculate GCD of two numbers (i) with recursion (ii) withoutrecursion.

21. Create Matrix class using templates. Write a menu-driven program to perform following Matrix
    operations (2-D array implementation):
    a)Sum   b) Differencec)Product   d)Transpose

22. Create the Person class. Create some objects of this class (by taking information from the user). Inherit the class Person to create two classes Teacher and Student class. Maintain the respective information in the classes and create, display and delete objects of these two classes (Use RuntimePolymorphism).

23. Create a class Triangle. Include overloaded functions for calculating area. Overload assignment operator and equalityoperator.

24. Create a class Box containing length, breath and height. Include following methods init:
    a) Calculate surfaceArea
    b) CalculateVolume
    c) Increment, Overload ++ operator (both prefix &postfix)
    d) Decrement, Overload -- operator (both prefix &postfix)
    e) Overload operator == (to check equality of two boxes), as a friendfunction
    f) Overload Assignmentoperator

g) Check if it is a Cube orcuboid

Write a program which takes input from the user for length, breath and height to test the above class.

25. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in afile.

26. Write a program to retrieve the student information from file created in previous question and print it in followingformat:

Roll No. NameMarks

27. Copy the contents of one text file to another file, after removing allwhitespaces.

28. Write a function that reverses the elements of an array in place. The function must accept only one pointer value and returnvoid.

29. Write a program that will read 10 integers from user and store them in an array. Implement array using pointers. The program will print the array elements in ascending and descending order.

Minor-1
(COSMI01)

Computer Fundamentals Theory

1.Illustrate different types of software and the concept of I/O devices and their evolution
2. Illustrate binary arithmetic code conversion; and solve Boolean logic minimization
3. Improve the combinational and sequential circuit design and minimization techniques
4. Design the fundamental combinational and sequential logic circuits; and counters and registers 5. Illustrate memory organization and CPU
6. Discuss about Emerging Technologies such as cloud computing, big data, data mining etc.

Introduction: Introduction to computer system, uses, types. Data Representation: Number systems and character representation, binary arithmeticarithmetic

Human Computer Interface: Types of software, Operating system as user interface, utility programs   **6L**

Devices: Input and output devices (with connections and practical demo), keyboard, mouse, joystick, scanner, OCR, OMR, bar code reader, web camera, ponitor, printer, plotter
6L

Memory: Primary, secondary, auxiliary memory, RAM, ROM, cache memory, hard disks, optical disks

Computer Organisation and Architecture: C.P.U., registers, system bus, main memory

unit, cache memory, Inside a computer, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors. **12L**

Overview of Emerging Technologies: Bluetooth, cloud computing, big data, data mining, mobile computing and embeddedsystems.

8L

Reference Books:

1. A. Goel, Computer Fundamentals, Pearson Education,2010.
2. P. Aksoy, L. DeNardis, Introduction to Information Technology, Cengage Learning,2006
3. P. K.Sinha, P. Sinha, Fundamentals of Computers, BPB Publishers,2007

Office Tools Lab :
60 Lecture

Practical exercises based on MS Office/ Open Office tools using document preparation and spreadsheet handling packages.
MS Word
1.   Prepare **a grocery list** having four columns (Serial number, The name of the product, quantity and price) for the month of April,06.

  ☐ Font specifications for Title (Grocery List): 14-point Arial font in bold anditalics.
  ☐ The headings of the columns should be in 12-point andbold.
  ☐ The rest of the document should be in 10-point Times NewRoman.
  ☐ Leave a gap of 12-points after thetitle.

2.   Create a **telephonedirectory**.
  ☐   The heading should be 16-point Arial Font inbold
  ☐   The rest of the document should use 10-point fontsize
  ☐ Other headings should use 10-point Courier NewFont.
  ☐ The footer should show the page number as well as the date lastupdated.

3.   Design a **time-table form** for yourcollege.
  ☐ The first line should mention the name of the college in 16-point Arial Font and should bebold.
  ☐ The second line should give the course name/teacher's name and the department in 14-pointArial
  ☐ Leave a gap of 12-points.
  ☐ The rest of the document should use 10-point Times New Romanfont.
  ☐ The footer should contain your specifications as the designer and date ofcreation.

4.   BPBPublicationsplanstoreleaseanewbookdesignedasperyoursyllabus.Designthe

first page of the book as per the given specifications.
- ☐ The title of the book should appear in bold using 20-point Arialfont.
- ☐ The name of the author and his qualifications should be in the center of the page in 16-point Arialfont.
- ☐ At the bottom of the document should be the name of the publisher and address in 16-point Times NewRoman.
- ☐ The details of the offices of the publisher (only location) should appear in thefooter.

5.   Create the following one pagedocuments.
- a. Compose a note inviting friends to a get-together at your house, Including a list of things to bring withthem.
- b. Design a certificate in landscape orientation with a border around thedocument.
- c. Design a Garage Salesign.
- d. Make a sign outlining your rules for your bedroom at home, using a numberedlist.

6.   Create the followingdocuments:
- (a) A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded bytext.
- (b) Use a newsletter format to promote upcoming projects or events in your classroom orcollege.

7.   Convert following text to a table, using comma as
delimiter Type the following as shown (do
notbold).
Color,
Style,
Item
Blue,
A980,
Van Red,
X023,Ca
r
Green, YL724,
Truck Name,
Age,Sex
Bob, 23, M
Linda, 46, F
Tom, 29, M

9. Enter the following data into a table given on the nextpage.

Salesperson	Dolls	Trucks	Puzzles
Kennedy, Sally	1327	142 3	1193

Salesperson			
White, Pete	1421	3863	2934
Pillar, James	5214	3247	5467
York, George	2190	1278	1928
Banks, Jennifer	1201	2528	1203
Atwater, Kelly	4098	3079	2067
Pillar, James	5214	3247	5467
York, George	2190	1278	1928
Banks, Jennifer	1201	2528	1203
Atwater, Kelly	4098	3079	2067

Add a column Region (values: S, N, N,S,S,S) between the Salesperson and Dolls columns to the given table Sort your table data by Region and within Region by Salesperson in ascending order:

In this exercise, you will add a new row to your table, place the word "Total" at the bottom of the Salesperson column, and sum the Dolls, Trucks, and Puzzles columns.

10. Wrapping of text around theimage.

11. Following features of menu option must be

    covered FILE   Completemenu
    EDIT   Completemenu
    VIEW   Completemenu
    INSERT   Completemenu
    FORMAT   Completemenu
    TABLE   Completemenu
    WINDOW   Completemenu
    HELP   Completemenu
    TOOLS   All options except Online collaboration, Tools on Macro,Templates

MSExcel

1.   Enter the Following data in ExcelSheet

TO
TA
L
AV
ER
AG
E

(a) Apply Formatting as
   follow: I.Title in
   TIMES
   NEWROMAN

   ii.   Font Size -14
   iii.   Remaining text - ARIAL, Font Size-10
   iv.   State names and Qtr. Heading Bold, Italic with Gray FillColor.
   v.   Numbers in two decimalplaces.
   vi.   Qtr. Heading in centerAlignment.
   vii.   Apply Border to wholedata.
   (b) Calculate State and Qtr.Total
   (c) Calculate Average for eachquarter
   (d) Calculate Amount = Rate *Total.
   2. Given the following worksheet

	A	B	C	D
1	Roll No.	Name	Marks	Grade
2	1001	Sachin	99	
3	1002	Sehwag	65	
4	1003	Rahul	41	
5	1004	Sourav	89	
6	1005	Har Bhajan	56	

Calculate the grade of these students on the basis of following guidelines:

If Marks	Then Grade
>= 80	A+
>= 60 < 80	A
>= 50 < 60	B

< 50		F		

3. Given the following worksheet

	A	B	C	D	E	F	G
1	**Salesman**			**Sales in (Rs.)**			
2	No.	Qtr1	Qtr2	Qtr3	Qtr4	Total	Commission
3	S001	5000	8500	12000	9000		
4	S002	7000	4000	7500	11000		
5	S003	4000	9000	6500	8200		
6	S004	5500	6900	4500	10500		
7	S005	7400	8500	9200	8300		
8	S006	5300	7600	9800	6100		

Calculate the commission earned by the salesmen on the basis of following Candidates:

If Total Sales	**Commission**
<20000	0% ofsales
> 20000 and<25000	4% ofsales
> 25000 and<30000	5.5% ofsales
> 30000 and<35000	8% ofsales
>=35000	11% ofsales

The total sales is sum of sales of all the four quarters.

4.   A company XYZ Ltd. pays a monthly salary to its employees which consists of basic salary, allowances & deductions. The details of allowances and deductions are as follows:

Allowances
- HRA Dependent onBasic

    30% of Basic if Basic <=1000

    25% of Basic if Basic>1000 &

    Basic<=3000 20% of Basic if Basic

    >3000

- DA Fixed for all employees, 30% ofBasic

- Conveyance Allowance Rs. 50/- if Basic
    is <=1000 Rs. 75/- if Basic >1000
    &Basic<=2000

    Rs. 100 if Basic>2000

  - Entertainment Allowance NIL if Basicis
    <=1000 Rs. 100/- if Basic > 1000

Deductions

- Provident Fund   6% ofBasic
- Group Insurance Premium Rs. 40/- if Basic is

    <=1500 Rs. 60/- if Basic > 1500

    &Basic<=3000

    Rs. 80/- if

Basic >3000 Calculate

the following:

GrossSalary   = Basic + HRA + DA + Conveyance +

Entertainment Total deduction = Provident Fund + Group

InsurancePremium

NetSalary   = Gross Salary – TotalDeduction

5. Create Payment Table for a fixed Principal amount, variable rate of interests and time in the formatbelow:

No. of Instalments	5%	6%	7%	8%	9%
3	XX	XX	XX	XX	XX
4	XX	XX	XX	XX	XX
5	XX	XX	XX	XX	XX
6	XX	XX	XX	XX	XX

6. Use an array formula to calculate Simple Interest for given principal amounts given the rate of Interest andtime

Rateof Interest	8%
Time	5Years
Principal	

	Simpl
e Interest 1000	?
18000	?
5200	?

7. The following table gives year wise sale figure of five salesmen inRs.

Salesman	2000	2001	2002	2003
S1	10000	12000	20000	50000
S2	15000	18000	50000	60000
S3	20000	22000	70000	70000
S4	30000	30000	100000	80000
S5	40000	45000	125000	90000

(a) Calculate total sale year wise.

(b) Calculate the net sale made by each salesman

(c) Calculate the maximum sale made by the salesman

(d) Calculate the commission for each salesman under the condition.

   (i) If total sales >4,00,000 give 5% commission on total sale made by the salesman.

   (ii) Otherwise give 2% commission.

(e) Draw a bar graph representing the sale made by each salesman.

(f) Draw a pie graph representing the sale made by salesman in 2000.

8.   Enter the following data in ExcelSheet

PERSONAL BUDGET FOR FIRST QUARTER

Monthly Income (Net): 1,475

EXPENSES	JAN	FEB	MARCH	QUARTER TOTAL	QUARTER AVERAGE
Rent600.00	600.00	600.00			
Telephone	48.25	43.50	60.00		
Utilities	67.27	110.00	70.00		
Credit Card	200.00	110.00	70.00		
Oil	100.00	150.00	90.00		
AV to Insurance	150.00				
Cable TV	40.75	40.75	40.75		

Monthly Total

Calculate Quarter total and Quarter average.

   (a) Calculate Monthlytotal.

   (b) Surplus = Monthly income - Monthlytotal.

   (c) What would be total surplus if monthly income is1500.

   (d) How much does telephone expense for March differ from quarteraverage.

   (e) Create a 3D column graph for telephone andutilities.

   (f) Create a pie chart for monthlyexpenses.

9.   Enter the following data in ExcelSheet

TOTAL REVENUE EARNED FOR SAM'S BOOKSTALL

Publisher name	1997	1998	1999	2000	total
A	Rs. 1,000.00	Rs. 1100.00	Rs. 1,300.00	Rs. 800.00	
B	Rs. 1,500.00	Rs. 700.00	Rs. 1,000.00	Rs. 2,000.00	
C	Rs. 700.00	Rs. 900.00	Rs. 1,500.00	Rs. 600.00	
D	Rs. 1,200.00	Rs. 500.00	Rs. 200.00	Rs. 1,100.00	
E	Rs 800.00	Rs. 1,000.00	Rs. 3,000.00	Rs. 560.00	

(a) Compute the total revenueearned.

(b) Plot the line chart to compare the revenue of all publisher for 4years.

(b) Chart Title should be _Total Revenue of sam's Bookstall(1997-2000)'

(c) Give appropriate categories and value axistitle.

10. Generate 25 random numbers between 0 & 100 and find their sum, average and count. How many no. are in range50-60

SEC-I

Computing Paradigm with Python Programming (COSSEC01):

Course outcome:

1.Write, Test and Debug Python Programs
2.Use functions and represent Compound data using Lists, Tuples and Dictionaries
3.Read and write data from & to files in Python and develop Application using Pygame

Brief introduction: What is Python, Uses of Python Programming Language / Python Applications, Features of Python Programming Language, Implementations of Python, and Python career opportunities.

Python Comments: Purpose/use of comments in Computer Programming, Comments for Understanding Python code, Python Comment Syntax, Python Single line comment, Multiline comment in Python, and writing Python comments.

Python Keywords and Identifiers: Python keywords or Reserved words, The syntax and structure of the Python language, Python keywords are case sensitive, Python literals (True, False, Null), Python Identifiers, class names, variable names, function names, method names, and Identifier naming rules.

Python Variables and Numbers: What is Variable?, Declaration of Variables, Assign Values to Variables, Initialization, Reading, Variable naming restrictions, and Types of Python Variables, Numbers.

Python Data Types: What is Data Type?, Implicit Declaration of Data Types, Python Numbers (Integers, floating-point numbers, and complex numbers), Python Strings, Python boolean data type.

Python Operators: Python Arithmetic, Comparison/Relational Operators, Increment Operators, Logical operators, Python Identity Operators, and Python Operators Precedence.

2. Python Control Flow – Decision Making and Looping

Decision Making in Python: Indentation, Simple If Structure, if-else structure, if elif structure, and nested If Structure.

Python Loop Statements:Python while loop, Python for loop, Python range(), Python Nested Loop Structures, and Inserting conditions in Loops and vice versa.

PythonBranching Statements:break, continue.

3. Python User Input/Output

Python user input from the keyboard can be read using the input() built-in function. The input from the user is read as a string and can be assigned to a variable. Python output statement.

4. Python Strings, List, Tuples, Set, Dictionaries

String:Finding String length, Concatenating Strings, Print a String multiple times, Check whether the String has all numeric characters and Check whether the String has all alphabetic characters?.

Lists: Create Python Lists, Display a list, Update Python Lists, and Add an element into Python List, Delete Elements from Python Lists, Sorting a list of Strings, Searching the List, and Built-in Functions & Built-in Methods for Python Lists.

Tuples: Some features, Conversion, Differences between tuples and lists.

Sets: Methods, Conversion, Set Theoretic Operations.

Dictionaries: Key and values, Attributes, Creating a Dictionary.

5. Python user-defined and Built-in Functions

Define user-defined function,Severalbuilt-in functions in Python.

6. Python Scripts for elementary Computations

Roots of quadratic Equation, Statistical Calculations, Factorial, Combination, Conversion of number system, Armstrong number, Strong number, Prime number, Palindrome number, Fibonacci number, Infinite series, Random number.

9. Numpy

Introducing Arrays: What is an array? Shape of an array, Dimensions, Resize, Creating one dimensional arrays, Algebra with arrays, Some useful functions, Array as Matrix, Matrix Operations, Arrays as Vectors, Polynomial by Numpy. Curve Fitting by Numpy:Fit with a user defined function.

Python Programming Lab (COSSEC01):

Using for loop, print a table of Celsius/Fahrenheit equivalences. Let c be the Celsius temperatures ranging from 0 to 100, for each value of c, print the corresponding Fahrenheit temperature.

1. Using while loop, produce a table of sins, cosines and tangents. Make a variable x in range from 0 to 10 in steps of 0.2. For each value of x, print the value of sin(x), cos(x) andtan(x).

2. Write a program that reads an integer value and prints ―leap year‖ or ―not a leapyear‖.

3. Write a program that takes a positive integer n and then produces n lines of output shown as follows.
   For example enter a size: 5
   *
   **
   ***
   ****
   *****

4. Write a function that takes an integer ‗n‘ as input and calculates

   the value of $1 + 1/1! + 1/2! + 1/3! + … +1/n$

5. Write a function that takes an integer input and calculates the factorial of thatnumber.

6. Write a function that takes a string input and checks if it‘s a palindrome ornot.

7. Write a list function to convert a string into a list, as in list (‗abc‘) gives [a, b,c].

8. Write a program to generate Fibonacciseries.

9. Write a program to check whether the input number is even orodd.

10. Write a program to compare three numbers and print the largestone.
11. Write a program to print factors of a given number.

12. Write a method to calculate GCD of twonumbers.

13. Write a program to create Stack Class and implement all its methods. (UseLists).

14. Write a program to create Queue Class and implement all its methods. (UseLists)

15. Write a program to implement linear and binary search onlists.

16. Write a program to sort a list using insertion sort and bubble sort and selectionsort.

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EMESTER II

Digital Electronics

Course Outcome

Student should be able to understand the concept of basic electronics. Understanding about different types of software and the concept of I/O devices and their evolution . Understanding binary arithmetic, code conversion; and solve Boolean logic minimization . Improve the combinational and sequential circuit design and minimization techniques Design the fundamental combinational and sequential logic circuits; and counters and registers . Discuss about Emerging Technologies such as cloud computing, big data, data mining etc.

Digital Circuits:
Logic gates, Boolean algebra, Karnaugh Maps;
Combinational Circuits:
Half adder, Full adder, Flip-flops,RS flip-flop, D- flip-flop, JK, T-flip flop, Edge-triggered flip flop, Encoders, Decoders, multiplexers, Registers shift register, buffer register counters;
Basic Computer Organization:
Instruction code, direct & indirect addresses, Timing and control signals, Instruction cycle, memory reference Instruction, I/O Instructions;
Computer Arithmetic:
Addition and subtraction with signed magnitude data, multiplication algorithms & Booth algorithm, hardware algorithm;
Memory:
Memory hierarchy, memory write ability and storage performance, memory units, memory types- ROM, masked programmed ROM, OTP ROM, EPROM, EEPROM, flash memory, Introduction to read-write memory RAM, SRAM, DRAM, PSRAM, MVRAM. Cache memory, Cache mapping technique, virtual memory concept, EDO RAM, Synchronous and enhanced synchronous DRAM, Rambus DRAM (RDRAM). Transistor as a switch, Switching time, Logic circuit, active and passive logic circuits, diode logic, register logic, register transistor logic (RTL), Register capacitor transistor logic (RCTL), Integrated injection logic (I2 L), transistor-transistor logic (TTL), Emitter coupled logic (LCTL) CML and CMOS logic interfacing TTL, and CMOS logic, their characteristics and uses;

A/D Converters:
Time window and slope converters, Tracking A/D and successive approximation converters, Digital to analog converters, LED and LCD display, seven segment display

MINOR –II: (COSMI02)

Information Technology & C programming :

Course Outcome

Illustrate the flowchart and design an algorithm for a given problem to develop c programs using operators.
o Develop conditional and iterative statements to write c programs.
o Exercise user defined functions to solve real time problems.
o Inscribe c programs that use pointers to access arrays ,strings and functions.
o Exercise user defined datatypes including structures and unions to solve problems.
o Inscribe c programs using pointers and to allocate memory using dynamic memory management functions.
o Exercise files concept to show input and output of files in c

Unit 1: Introduction - Introduction to computer system, uses, types.
Unit 2: Human Computer Interface - Types of software, Operating system as user interface, utility programs, algorithm, flowchart.
Unit 3: Devices - Input and output devices (with connections and practical demo), keyboard, mouse, joystick, scanner, OCR, OMR, bar code reader, web camera, monitor, printer, plotter
Unit 4: Memory- Primary, secondary, auxiliary memory, RAM, ROM, cache memory, hard disks, optical disks
Unit 5: Computer Organization and Architecture - C.P.U., registers, system bus, main memory unit, cache memory, Inside a computer, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors.
Unit 6: Overview of Emerging Technologies:
Bluetooth, cloud computing, big data, data mining, mobile computing and embedded systems.
Introduction To C Programming
UNIT- I
Introduction to the C Language – Algorithm, Pseudo code, Flow chart, Background, C Programs, Identifiers, Data Types, Variables, Constants, Input / Output, Operators(Arithmetic, relational, logical, bitwise etc.), Expressions, Precedence and Associatively, Expression Evaluation, Type conversions.
UNIT- II
Statements- Selection Statements(making decisions) – if and switch statements, Repetition statements (loops)-while, for, do-while statements, Loop examples, other statements related to looping – break, continue, go to, Simple C Program examples.
UNIT- III
Functions- Introduction to Structured Programming, Functions- basics, user defined functions, inter
function communication(call by value, call by reference), Standard functions.
Storage classes-auto, register, static, extern, scope rules, arrays to functions, recursive functions, example C programs.
UNIT – IV
Arrays– Basic concepts, one-dimensional arrays, two – dimensional arrays, multidimensional arrays,

C programming examples Pointers – Introduction (Basic Concepts), pointers to pointers, compatibility, Pointer Applications, Arrays and Pointers, Pointer Arithmetic, memory allocation functions, array of pointers, pointers to void, pointers to functions, command –line arguments, Introduction to structures and unions.

UNIT-V

Strings – Concepts, C Strings, String Input / Output functions, string manipulation functions, string/data conversion.

Input and Output – Concept of a file, streams, text files and binary files, Differences between text and binary files, State of a file, Opening and Closing files, file input / output functions (standard library input / output functions for files), file status functions (error handling),Positioning functions.

TEXT BOOKS:

1. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. The C Programming Language by Brian Kernighan and Dennis Ritchie 2nd edition

REFERENCE BOOKS:

1. Let Us C Yashavant kanetkar BPB.
2. Absolute beginner's guide to C, Greg M. Perry, Edition 2, Publisher: Sams Pub., 1994.
3. Computer Programming and Data Structures by E Balagurusamy, Tata McGraw Hill

SEC 02

HTML Programming

Course Outcome

After completing this course, students will be able to structure, organize, and publish a website using HTML5 and CSS including how to view a site's HTML and understand its structure, purpose.

- **Unit-I: Introduction**
- **Unit-II: The Basics**
  - The Head, the Body
  - Colors, Attributes
  - Lists, ordered and unordered
- **Unit-III: Links**
  - Introduction
  - Relative Links, Absolute Links
  - Link Attributes
  - Using the ID Attribute to Link Within a Document
- **Unit-IV: Images**
  - Putting an Image on a Page
  - Using Images as Links
  - Putting an Image in the Background
- **Unit V: – Tables**
  - Creating a Table
  - Table Headers
  - Captions
  - Spanning Multiple Columns
  - Styling Table
- **Unit VI – Forms**
  - Basic Input and Attributes
  - Other Kinds of Inputs o Styling forms with CSS
  - Where To Go From Here

Unit –V

Introduction to Cascading Style Sheets (CSS)
The style tag
Tag selectors
The font-size, font-family, color, & line-height properties
Hexadecimal color codes

CSS Class Selectors
- The class attribute
- CSS class selectors
- The span tag
- CSS opacity

Div Tags, ID Selectors, & Basic Page Formatting
- Dividing up content with the div tag
- Assigning IDs to divs
- Setting width & max-width
- CSS background-color
- Adding padding inside a div

- o Centering content
- o CSS borders
- o CSS shorthand & the DRY principle

Using Browser Developer Tools

- o Opening the DevTools in Chrome
- o Editing HTML in the DevTools Elements panel
- o Enabling, disabling, & editing CSS in the DevTools
- o Using DevTools to fine-tune your CSS
- o Hexadecimal shorthand

HTML5 Semantic Elements & Validating HTML

- o The outline algorithm
- o The header, nav, aside, & footer elements
- o Understanding articles & sections
- o The main element
- o The figure & figcaption elements
- o Checking for errors: validating your code

Unit-VII

Basic Concept of Node Js

Book Recommended:

1. Virginia DeBolt , Integrated HTML and CSS A Smarter, Faster Way
   to Learn Wiley / Sybex , 2006
2. Cassidy Williams, Camryn Williams Introduction to **HTML** and CSS, O'Reilly, 2015