

Egra S. S. B. College

Department of Computer Science

SYLLABUS DISTRIBUTION

Semester-II

Paper	Teacher	Detailed Syllabus
DSC-1B (CC-2): Database Management System	AM	Unit1: Introduction to Database Management Systems: Characteristics of database approach, data models, DBMS architecture and data independence. Unit 2. Entity Relationship and Enhanced ER Modeling: Entity types, relationships, SQL- 99: Schema Definition, constraints, and object modeling.
	LM	Unit 3. : Relational Data Model: Basic concepts, relational constraints, relational algebra, SQL queries. Unit 4. : Database design: ER and EER to relational mapping, functional dependencies and normal forms up to third normal form.
DSC-1BP: Software Lab based on Database Management System (Lab)	AM	DDL Commands: Create table, alter table, drop table
	LM	DML Commands: <ul style="list-style-type: none"> • Select , update, delete, insert statements • Condition specification using Boolean and comparison operators (and, or, not, =, <>, >, =, <=) • Arithmetic operators and aggregate functions(Count, sum, avg, Min, Max) • Multiple table queries (join on different and same tables) • Nested select statements • Set manipulation using (any, in, contains, all, not in, not contains, exists, not exists, union, intersect, minus, etc.) • Categorization using group by.....having • Arranging using order by
GE-1: Computer Fundamentals	AM	Unit 1. Introduction: Introduction to computer system, uses, types Unit 3. Human Computer Interface: Types of software, operating system as user interface, utility programs. Unit 4. Devices: Input and Output devices(with connections and practical demo),keyboard, mouse, joystick, scanner, OCR, OMR, barcode reader, web camera, monitor, printer, plotter Unit 7. Overview of Emerging Technologies: Bluetooth, cloud computing, big data, data mining, mobile computing and embedded systems.
	LM	Unit 2. Data Representation: Number Systems and Character Representation, Binary arithmetic. Unit 5. Memory: Primary, Secondary, Auxiliary memory, RAM, ROM, cache memory, hard disk optical disk Unit 6. Computer Organisation and Architecture: C.P.U., registers, system bus, main memory unit, cache memory, inside a computer, SMPS, Mother board, Ports and interfaces, expansion cards, ribbon cables, memory chips, processors.

GE-1: Computer Fundamentals Lab	AM	<ul style="list-style-type: none"> • MS Word
	LM	<ul style="list-style-type: none"> • MS Excel

Semester-IV		
DSC-1D (CC-4) : Computer System Architecture	AM	<p>Unit 1. Introduction: Logic gates, Boolean algebra, combinational circuits, circuit simplification, flip-flops and sequential circuits, decoders, multiplexors, registers, counters and memory units.</p> <p>Unit 5. Programming the Basic Computer: Instruction formats, addressing modes, instruction codes, machine language and assembly language, input output programming.</p> <p>Unit 6. Input-output Organization: Peripheral devices, I/O interface, Modes of data transfer, direct memory access.</p>
	LM	<p>Unit 2. Data Representation and basic Computer Arithmetic: Number systems, complements, fixed and floating point representation, character representation, addition, subtraction, magnitude comparison.</p> <p>Unit 3. Basic Computer Organization and Design: Computer registers, bus system, instruction set, timing and control, instruction cycle, memory reference, input-output and interrupt.</p> <p>Unit 4. Central Processing Unit: Register organization, arithmetic and logical micro-operations, stack organization, micro programmed control.</p>
DSC-1D (CC-4): Computer System Architecture	LM/AM	Microprocessor

GE-4: Programming in python	AM	<p>Unit 1. Planning the computer Program: Concept of problem solving, problem definition, program design, debugging, Types of errors in programming documentation</p> <p>Unit 2. Technique of Problem Solving: Flowcharting, decision table, algorithms, structured programming concepts, programming methodologies viz. top-down and bottom-up programming.</p> <p>Unit 3. Overview of programming: Structure of python Programs, Elements of Python</p> <p>Unit 4. Introduction to Python: Python Interpreter, Using Python as a Calculator, Python Shell, Indentation. Atoms, Identifiers and keywords, Literals, String, Operators (Arithmetic Operators, Relational Operators, Logical or Boolean operator, assignment operator, ternary Operator, Bitwise Operator, Increment/ Decrement operator)</p>
	LM	<p>Unit 5. Creating Python programs: Input and Output Statements, control Statements (Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass), Defining functions, default Arguments, Errors and Exceptions.</p> <p>Unit 6. Iteration and Recursion: Conditional execution, Alternative execution, nested conditionals, The return statement, Recursion, stack diagrams for recursive functions, Multiple assignment, The while statement, Tables, Two dimensional Tables</p> <p>Unit 7. Strings and Lists: String as a compound data type, length, traversal and for loop, string slices, string comparison, a find function, looping and counting, Lists values, Accessing Elements, List Length, List membership, Lists and for loops, List operations, List deletion. Cloning lists, nested lists Object Oriented programming: Introduction to class, objects and methods, standard libraries.</p> <p>Unit 8. Data Structures: Array, Lists, set, stacks and queues Searching and sorting: Linear and binary search, bubble, selection and insertion sorting.</p>
GE-4: Programming in python Practical (Lab)	AM	<ol style="list-style-type: none"> 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. Using while loop produce a table of sines, 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) and tan(x). Write a program that reads an integer value and prints—leap year or—not a leap year 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 * ** *** **** ***** Write a function that takes an integer_n' as input and calculates the value of $1+1/1!+1/2!+1/3!+....+1/n$ Write a function that takes an integer input and calculates the factorial of that number

		<p>10. Write a program to check whether the input number is even or odd</p> <p>11. Write a program to compare three numbers and print the largest one.</p>
	LM	<p>7. Write a function that takes a string and check if it is a palindrome or not.</p> <p>8. Write a list function to convert a string into a list, as in list ('_abc') gives [a, b, c].</p> <p>9. Write a program to generate Fibonacci series.</p> <p>12. Write a program to print factors of given number.</p> <p>13. Write a method to calculate GCD of two numbers.</p> <p>14. write a program to create stack class and implement all its methods.(Use Lists)</p> <p>15. Write a program to create Queue Class and implement all its methods.(Use Lists)</p> <p>16. Write a program to implement linear and binary search on lists.</p> <p>17. rite a program to sort a list using insertion sort and bubble sort and selection sort</p>

Semester-VI

DSE-2: Ecommerce Technology	AM	<p>Unit 1. An introduction to Electronic commerce: What is E-Commerce (Introduction And Definition), Main activities E-Commerce, Goals of E-Commerce, Technical Components of E-Commerce, Functions of E-Commerce, Advantages and disadvantages of E-Commerce, Scope of E-Commerce, Electronic Commerce Applications, 9 Electronic Commerce and Electronic Business(C2C)(C2G,G2G, B2G, B2P, B2A, P2P, B2A, C2A, B2B, B2C) .</p> <p>Unit 2. The Internet and WWW: Evolution of Internet, Domain Names and Internet Organization (.eddo, .com, .mil, .Gov., .net etc.) , Types of Network, Internet Service Provider, World Wide Web, Internet & Extranet, Role of Internet in B2B Application, building own website, Cost, Time, Reach, Registering a Domain Name, Web promotion, Target email, Banner, Exchange, Shopping Bots .</p> <p>Unit 6. Internet Marketing: The PROS and CONS of online shopping, The cons of online shopping, Justify an Internet business, Internet marketing techniques, The E-cycle of Internet marketing, Personalization ecommerce.</p>
	LM	<p>Unit 3. Internet Security: Secure Transaction, Computer Monitoring, Privacy on Internet, Corporate Email privacy, Computer Crime(Laws , Types of Crimes), Threats, Attack on Computer System, Software Packages for privacy, Hacking, Computer Virus(How it spreads, Virus problem, virus protection, Encryption and Decryption, Secret key Cryptography, DES, Public Key Encryption, RSA, Authorisation and Authentication, Firewall, Digital Signature(How it Works) .</p>

		<p>Unit 4. Electronic Data Exchange: Introduction, Concepts of EDI and Limitation, Applications of EDI, Disadvantages of EDI, EDI model, Electronic Payment System: Introduction, Types of Electronic Payment System, Payment Types, Value Exchange System, Credit Card System, Electronic Fund Transfer, Paperless bill, Modern Payment Cash, Electronic Cash .</p> <p>Unit 5. Planning for Electronic Commerce: Planning Electronic Commerce initiatives, Linking objectives to business strategies, Measuring cost objectives, Comparing benefits to Costs, Strategies for developing electronic commerce web sites.</p>
DSE-2: Ecommerce Technology(Lab)	LM	<p>E-commerce concepts are to be implemented in developing a website using a combination of following technologies:</p> <ol style="list-style-type: none"> 1. Hypertext Markup Language (HTML) 2. Cascading Style Sheets (CSS) 3. JavaScript 4. ASP 5. PHP 6. XML 7. Joomla
SEC-4: XML Programming	AM	<p>Unit 1. Introduction: Understanding Mark-up Languages, Introduction to XML and its Goals.</p> <p>Unit 2. XML Basics: XML Structure and Syntax, Document classes and Rules</p>
	LM	<p>Unit-3. Other XML Concepts: Scripting XML, XML as Data, Linking with XML.</p> <p>Unit 4. XML with Style: XSL –Style Sheet Basics, XSL basics, XSL style sheets.</p>
SEC-4: XML Programming Lab	AM	<p>Exercise #1 – Information Structure</p> <ol style="list-style-type: none"> 1. Draw a tree representation of the structure. <p>Exercise 2# Deconstructing an XML Document</p> <ol style="list-style-type: none"> 1. For the sample XML mark-up below, create a document like representation (or a simple drawing) for the content contained within the XML tags
	LM	<p>Exercise #3 – Creating XML Mark-up In this exercise, create some XML mark-up based on the tree representation from Exercise #1 above, and the content from the original sample document.</p> <p>Exercise #4 – Well-Formedness</p>

Semester-I

DSC-1A(CCI): Problem Solving using Computers	AM	<p>Unit-1: Computer Fundamentals: Introduction to Computers: Characteristics of Computers, Uses of computers, Types and generations of Computers. Basic Computer Organization - Units of a computer, CPU, ALU, memory hierarchy, registers, I/O devices.</p> <p>Unit-2: Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.</p>
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		<p>Unit-3: Techniques of Problem Solving: Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.</p> <p>Unit-4: Overview of Programming: Structure of a Python Program, Elements of Python .</p>
	LM	<p>Unit -5: Introduction to Python: Python Interpreter, Using Python as calculator, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator).</p> <p>Unit -6: Creating Python Programs: Input and Output Statements, Control statements (Looping- while Loop, for Loop , Loop Control, Conditional Statement- if...else, Difference between break, continue and pass).</p> <p>Unit -7: Structures: Numbers, Strings, Lists, Tuples, Dictionary, Date & Time, Modules, Defining Functions, Exit function, default arguments.</p> <p>Unit -8: Introduction to Advanced Python: Objects and Classes, Inheritance, Regular Expressions, Event Driven Programming, GUI Programming.</p>
Practical: DSC-1A(CC1): Problem Solving using Computers(lab)	AM	<p>A (Simple programs)</p> <p>1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.</p> <p>2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria : Grade A: Percentage ≥ 80</p> <p>Grade B: Percentage ≥ 80 and < 70</p> <p>Grade C: Percentage < 60</p>
	LM	<p>4. WAP to display the first n terms of Fibonacci series.</p> <p>5. WAP to find factorial of the given number.</p> <p>6. WAP to find sum of the following series for n terms: $1 - \frac{2}{2!} + \frac{3}{3!} - \dots - \frac{n}{n!}$</p> <p>7. WAP to calculate the sum and product of two compatible matrices.</p>

GE-1: Computer Fundamentals	AM	<p>UNIT- 1: Introduction: Introduction to computer system, uses, types.</p> <p>UNIT -2: Data Representation : Number system and character representation, binary arithmetic</p> <p>UNIT-3:Human Computer Interface: Types of software, Operating system as user interface, utility programs</p> <p>UNIT-4: Devices: Input and output devices(with connection and practical demo),keyboard, mouse, joystick, scanner, OCR, OMR, bar code reader, web camera, monitor, printer plotter</p>
	LM	<p>UNIT-5: Memory: primary, secondary, auxiliary memory, RAM, ROM, cache memory, hard disks, optical disks</p> <p>UNIT-6: 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.</p> <p>UNIT-6:Overview of Emerging Technologies: Bluetooth, cloud computing, big data, data mining, mobile computing, and embedded systems</p>
Practical GE-1: Computer Fundamentals(Lab)	AM	<p>Computer fundamental Lab: Practical exercises based on MS Office/ Open Office tools using document preparation and spreadsheet handling packages.</p>
	LM	<p>Computer fundamental Lab: Practical exercises based on MS Office/ Open Office tools using document preparation and spreadsheet handling packages.</p>
Semester-III		
DSC-1C(CC3) : Operating System	AM	<p>Unit 1: Introduction: System Software, Resource Abstraction, OS strategies.</p> <p>Unit 2: Types of operating systems - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems.</p> <p>Unit 3: Operating System Organization: Factors in operating system design, basic OS functions, implementation consideration; process modes, methods of requesting system services – system calls and system programs.</p> <p>Unit 4: Process Management : System view of the process and resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy, Thread model</p>

	LM	<p>Unit 5: Scheduling: Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies.</p> <p>Unit 6: Memory Management: Mapping address space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory</p> <p>Unit 7: Shell introduction and Shell Scripting</p> <ul style="list-style-type: none"> → What is shell and various type of shell, Various editors present in Linux → Different modes of operation in vi editor → What is shell script, Writing and executing the shell script → Shell variable (user defined and system variables) → System calls, Using system calls → Pipes and Filters → Decision making in Shell Scripts (If else, switch), Loops in shell → Functions → Utility programs (cut, paste, join, try , unique utilities) → Pattern matching utility (grep)
DSCICP: Software Lab based on Operating Systems (Lab)	LM/AM	<ol style="list-style-type: none"> 1. Usage of following commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd. 2. Usage of following commands: cal, cat(append), cat(concatenate), mv, cp, man, date. 3. Usage of following commands: chmod, grep, tput (clear, highlight), bc. 4. Write a shell script to check if the number entered at the command line is prime or not. 5. Write a shell script to modify “cal” command to display calendars of the specified months. 6. Write a shell script to modify “cal” command to display calendars of the specified range of months. 7. Write a shell script to accept a login name. If not a valid login name display message – “Entered login name is invalid”. 8. Write a shell script to display date in the mm/dd/yy format.

		<p>9. Write a shell script to display on the screen sorted output of “who” command along with the total number of users.</p> <p>10. Write a shell script to display the multiplication table any number,</p> <p>11. Write a shell script to compare two files and if found equal asks the user to delete the duplicate file.</p> <p>12. Write a shell script to find the sum of digits of a given number.</p> <p>13. Write a shell script to merge the contents of three files, sort the contents and then display them page by page.</p> <p>14. Write a shell script to find the LCD (least common divisor) of two numbers.</p> <p>15. Write a shell script to perform the tasks of basic calculator.</p> <p>16. Write a shell script to find the power of a given number.</p> <p>17. Write a shell script to find the factorial of a given number.</p>
<p style="text-align: center;">GE-3: Introduction to programming</p>	<p style="text-align: center;">AM</p>	<p>Unit-1: Introduction to Programming: History of c and C++, overview of procedural programming and object oriented programming, using main function(), compiling and executing sample programs in C++</p> <p>Unit-2: Data types, Variables, constants, Operators and basic I/O : 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, putchar etc.), Formatted and console I/O(Printf(), Scanf(), cin, cout), Using basic Header Files(stdio.h, iostream.h, conio.h etc.)</p> <p>Unit-3: Expressions, Conditional statements and Iterative Statements : 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)</p> <p>Unit-7: Using classes in C++ : Principles of Object Oriented Programming, defining and using classes, class Constructors, Constructor Overloading, Function Over loading in classes, class variables and functions, objects as parameters, specifying the protected and private access, copy Constructors, overview of template classes and their use.</p>

	LM	<p>Unit-4: Functions and Arrays: Utility of functions, call by value, Call by Reference, functions returning value, void functions, Inline Functions, Return Data type of functions, function parameters, differentiating between declaration and definition of function, Command line arguments/ Parameter in Functions, Functions with variable number of arguments.</p> <p>Creating and using one dimensional array(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.</p> <p>Unit-5: Derived Data Types(Structures and Unions) Understanding utility of structures and unions, declaring , Initializing and using simple structures and unions, Manipulating individual Members of structures and unions, Arraya of structures, Individual data members as structures, passing and returning structures from functions, structures with union as members, inion with structures as members.</p> <p>Unit-6: File I/O, Preprocessor Directives: 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 infiles, Understanding the preprocessor Directives(#include, #define, #if, #else, #elif, #endif, #ifdef, #ifndef and #undef), Macros</p> <p>Unit-8: Inheritance and Polymorphism : Introduction to Inheritance and Polymorphism</p>
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GE-3: Introduction to programming	AM	<ol style="list-style-type: none"> 1. Write a program to find greatest number among three numbers. 2. Write a program to find gross salary of a person. 3. Write a program to find grade of students given his marks. 4. Write a program to find greatest number among three numbers.
	LM	<ol style="list-style-type: none"> 5. Write a program to print first ten natural numbers. 6. Write a program to find divisor or factorial of a given number 7. Create matrix class. Create a menu driven program to perform the following Matrix operation (2D array implementation) <ol style="list-style-type: none"> a)sum b) difference c) Product d) Transpose

Semester-V

DSE-1: Software Engineering	AM	<p>Unit 1. Software Process: Introduction ,S/W Engineering Paradigm , life cycle models (water fall, incremental, spiral, evolutionary, prototyping, object oriented) , System engineering, computer based system, verification, validation, life cycle process, development process, system engineering hierarchy.</p> <p>Unit 2. Software requirements: Functional and non-functional , user, system, requirement engineering process, feasibility studies, requirements, elicitation, validation and management, software prototyping, prototyping in the software process, rapid prototyping techniques, user interface prototyping, S/W document. Analysis and modelling, data, functional and behavioural models, structured analysis and data dictionary.</p> <p>Unit 3. Design Concepts and Principles: Design process and concepts, modular design, design heuristic, design model and document, Architectural design, software architecture, data design, architectural design, transform and transaction mapping, user interface design, user interface design principles. Real time systems, Real time software design, system design, real time executives, data acquisition system, monitoring and control system.</p> <p>Unit 4. Software Configuration Management: The SCM process, Version control, Change control, Configuration audit, SCM standards.</p>
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	LM	<p>Unit 5. Software Project Management: Measures and measurements, S/W complexity and science measure, size measure, data and logic structure measure, information flow measure. Estimations for Software Projects, Empirical Estimation Models, Project Scheduling.</p> <p>Unit 6. Testing: Taxonomy of software testing, levels, test activities, types of s/w test, black box testing testing. boundary conditions, structural testing, test coverage criteria based on data flow, mechanisms, regression testing, testing in the large. S/W testing strategies, strategic approach and issues, unit testing, integration testing, validation testing, system testing and debugging.</p> <p>Unit 7. Trends in Software Engineering: Reverse Engineering and Re-engineering – wrappers – Case Study of CASE tools.</p>
DSE-1: Software Engineering (Lab)	LM/AM	Software Project Design using HTML and CSS
SEC-3: Programming with Matlab	AM	<p>Unit 1. MATLAB Basics The MATLAB environment - Basic computer programming - Variables and constants, operators and simple calculations - Formulas and functions - MATLAB toolboxes</p> <p>Unit 2. Matrices and vectors Matrix and linear algebra review - Vectors and matrices in MATLAB - Matrix operations and functions in MATLAB</p>
	LM	<p>Unit 3. Computer programming Algorithms and structures - MATLAB scripts and functions (m-files) - Simple sequential algorithms - Control structures</p> <p>Unit 4. MATLAB programming and Numerical Simulations Mat lab Programming. Reading and writing data, file handling - Personalized functions - Toolbox structure - MATLAB graphic functions. Numerical simulations. Numerical methods and simulations - Random number generation – Monte carlo methods</p>

AM – Atanu Manna

LM – Lila Misra