ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-I (PG)

NAME OF FACULTY: Dr. Samir Malakar

PAPER: CSMC 101 (TH)

LECTURES ALLOTTED: 16 (1.5 hr. each)

ALLOTTED SYLLABUS:

Recurrence relations and solution methods
Definition of recurrence relations, formulating recurrence relations, solving recurrence relations-Backtracking method, Linear homogeneous recurrence relations with constant coefficients. Solving linear homogeneous recurrence relations with constant coefficients of degree two when characteristic equation has distinct roots and only one root, Particular solutions of nonlinear homogeneous recurrence relation, Solution of recurrence relation by the method of generating functions
Applications- Formulate and solve recurrence relation for Fibonacci numbers, Tower of Hanoi, Intersection of lines in a plane, and Sorting Algorithms.

Graph theory
Introduction to Graphs & its Applications, Trees, and Distance, Properties of Trees, Spanning Trees and Enumeration, Matrix-tree computation, Cayley's Formula, Matchings and Covers, Min-Max Theorem, Independent Sets, Cuts and Connectivity, k-Connected Graphs, Vertex Coloring, Counting Proper Colorings. Planar Graphs, Characterization of Planar Graphs, Kuratowski's Theorem, Wagner's Theorem.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Definition of recurrence relations, Formulating recurrence relations, solving recurrence relations-Backtracking method, Linear homogeneous recurrence relations with constant coefficients
2	Solving linear homogeneous recurrence relations with constant coefficients of degree two when characteristic equation has distinct roots and only one root
3	Particular solutions of the nonlinear homogeneous recurrence relation.
4	Solving practice problems till lecture 3.
5	Solution of recurrence relation by the method of generating functions

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

6	Formulate and solve recurrence relation for Fibonacci numbers, Tower of Hanoi
7	Formulate and solve recurrence relation for the intersection of lines in a plane, and sorting algorithms.
8	Solving practice problems till lectures 4-7.
9	Introduction to Graphs & its Applications, Trees, and Distance
10	Properties of Trees, Spanning Trees and Enumeration, Matrix-tree computation, Cayley's Formula
11	Matchings and Covers, Min-Max Theorem, Independent Sets
12	Cuts and Connectivity, k-Connected Graphs, Vertex Coloring
13	Counting Proper Colorings. Planar Graphs, Characterization of Planar Graphs
14	Kuratowski's Theorem, Wagner's Theorem
15	Solving practice problems till lectures 10-15.
16	Continuation of solving practice problems till lectures 10-15 and University questions discussions.

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-I (PG)

NAME OF FACULTY: Dr. Samir Malakar

PAPER: CSMC 102 (TH) [Data Structures and Algorithms]

LECTURES ALLOTTED: 18 (2 hrs. each)

ALLOTTED SYLLABUS:

Module-1: Review of Basic Data Structures
Applications of Basic Data Structures: Stacks, Queues, Arrays, Linked Lists, Trees.
Data Structure for Efficient Searching: Binary search tree, AVL tree, Decision tree, Hashing.

Module-2: Advanced Data Structures
External Memory Data Structures: B-tree, B^* tree; **Amortized Analysis of Algorithms; Dictionary and Priority Queue**: Binomial Heaps and Fibonacci Heaps; **Set Manipulation:** Disjoint Set Data Structures.

Module-3: Algorithm Design Paradigms
Review on Algorithm Designing Techniques: **Greedy** (like Computing a maximal independent set in a matroid and its applications to Activity scheduling and Minimum spanning tree), **Divide and Conquer** (like Integer multiplication and Matrix multiplication), **Dynamic Programming** (like Longest common subsequence and Fibonacci sequence), Biconnected Components, Strongly Connected Components.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to Data structure and a walkthrough of graduation topics
2	Review of Basic Data Structures: Arrays, and Linked lists
3	Review of Basic Data Structures: Stacks, and Queues
4	Data Structure for Efficient Searching: Binary search tree, and AVL tree.
5	Data Structure for Efficient Searching: Decision tree, and Hashing.
6	External Memory Data Structures: B-tree, B*-tree
7	Amortized Analysis of Algorithms, Comparison with asymptotic notations, Credit balance as example.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

8	Dictionary and Priority Queue: Binomial Heaps and Fibonacci Heaps
9	Set Manipulation: Disjoint Set Data Structures, Union find algorithm
10	Review on Greedy Algorithm Designing Technique: Computing a maximal independent set in a matroid and its applications to Activity scheduling and Minimum spanning tree
11	Continuation of Lecture 10
12	Review on Divide and Conquer Algorithm Designing Techniques like Integer multiplication and Matrix multiplication.
13	Continuation of Lecture 12
14	Review on Dynamic Programming Algorithm Designing Techniques like Longest common subsequence and Fibonacci sequence
15	Continuation of Lecture 14
16	Biconnected Components, Strongly Connected Components
17	Problem Discussion
18	University previous year question answer discussion

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 1

NAME OF FACULTY: ANTIKA SINHA

PAPER: CSMC 104 (Object Oriented Systems) Theory

LECTURES ALLOTTED: 20P (2 hours each)

ALLOTTED SYLLABUS:

Topics
Module1: Introduction to OOPS; Abstraction, Encapsulation, Generalization. Specialization, Functional decomposition vs Object oriented decomposition. Coupling cohesion, Modularity and hierarchy, Relationship among classes and objects. object, compile vs run time binding, generic programming.
Module 2: Overview of UML, SDLC phases and UML diagrams, Static UML diagrams: Class diagrams, Object diagrams, Component diagrams, Package diagrams, Composite diagrams. Dynamic UML diagram: Activity diagrams, Usecase diagrams, State diagrams, Sequence diagrams, Communication diagrams, Interaction overview diagrams.
Module 3: Design pattern basics, benefits; Creational pattern: Refections, Singleton, Object pool, Factory, Abstract Factory, Buider, Prototype. Structural pattern: Adapter, Bridge, Composite, Decorator, Flyweight, Facade, Proxy. Behavioural pattern: Interpreter, Template method, Chain of responsibility, Command, Iterator, Mediator, Memento, Observer, State, Visitor, Strategy.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 1

NAME OF FACULTY: ANTIKA SINHA

PAPER: CSMC 104 (Object Oriented Systems) Theory

LECTURES ALLOTTED: 20P (2 hours each)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to OOPS; Abstraction, Encapsulation, Generalization.
2	Specialization, Functional decomposition vs Object oriented decomposition with example.
3	Coupling cohesion, Modularity and hierarchy, Relationship among classes and objects.
4	Recap of Class, object, compile vs run time binding, generic programming.
5	UML basics; classdiagram symbols, relationships and examples.
6	Object diagram, component diagram and examples.
7	Package diagram, composite diagram and examples.
8	Activity diagram, use case diagram and examples.
9	State diagram, sequence diagram and examples.
10	Design pattern; introduction and usefulness; reflection pattern
11	Singleton pattern, object pool pattern with examples.
12	Factory, Abstract factory pattern with examples and diagrams.
13	Builder, Prototype pattern with examples.
14	Adapter, Bridge, Composite pattern with examples
15	Flyweight, facade, proxy pattern with examples.
16	Iterator, chain of responsibility pattern with examples.
17	Interpretor, template, command pattern with examples

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 1

NAME OF FACULTY: ANTIKA SINHA

PAPER: CSMC 104 (Object Oriented Systems) Theory

LECTURES ALLOTTED: 20P (2 hours each)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
18	Mediator, Observer pattern with examples.
19	Recap and practice class.
20	Recap and practice class.

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-I

NAME OF FACULTY: Dr. Samir Malakar

PAPER: CSMP105 (P), Module – I

LECTURES ALLOTTED: 16 (3hrs. each)

ALLOTTED SYLLABUS:

Assignments:

1. Write an algorithm to differentiate the edges of an undirected graph following the notion of depth-first search, based on your sequence of visiting the vertices. Choose appropriate data structure(s) for the said purpose and make clear why and how the data structure(s) is (are) suitable.
2. Write algorithm(s) that evaluate(s) a given expression in its infix form. Choose appropriate data structure(s) for the said purpose and make clear why and how the data structure(s) is (are) suitable.
3. If the elements in the band formed by the three diagonals of a tri-diagonal matrix X are represented column-wise in an array Y, with X [1,1] being stored in Y[1], then write an algorithm to determine the value of X[i, j], $1 \leq i, j \leq n$ from array Y.
4. Write an algorithm to compute the shortest distance and the path between a pair of vertices of an undirected graph, based on your sequence of visiting the vertices. Choose appropriate data structure(s) for the said purpose and make clear why and how the data structure(s) is (are) suitable.
5. Devise a scheme in computing a polynomial C, where C is computed by (i) multiplying two polynomials A and B, and (ii) differentiating polynomial A. Choose appropriate data structure(s) for the said purpose, and make clear why and how the data structure(s) is (are) suitable.
6. Write an algorithm to construct an equivalent binary tree of the following forest that comprises T1 and T2. Clearly show the necessary steps of the construction.
   (i) T1: (A(B(E,F),C(G),D(H(K),I(L,M),J))), and
   (ii) T2: (N(O(P))).
7. Consider a sequence of *n* elements and construct an AVL tree after insertion of each element into the tree. Choose appropriate data structure(s) for the said purpose and make clear why and how the data structure(s) is (are) suitable.
8. Let X and Y be two lower triangular matrices, each with *n* rows. Devise a scheme to represent both the triangles in an array Z of size $n \times (n+1)$. Write algorithms to determine the values of X[i, j] and Y[i, j], $1 \leq i, j \leq n$ from array Z. Choose appropriate data structure(s) for the said purpose, and make clear why and how the data structure(s) is (are) suitable.
9. Write an algorithm that computes a B-tree of order *m* and perform insertion of an element into the tree as well as deletion of an element from the tree. As for example, consider the keys to be inserted are: *a*5, *g*2, *f*1, *b*3, *k*3, *d*6, *g*4, *m*5, *j*2, *e*3, *s*1, *j*1, *r*5, *z*7, *b*6, *m*2, *m*9, *t*3, *u*5, *q*6 into an initially empty tree, in the order given, when the value of $m = 5$. Also delete the keys one after another, from the final B-tree obtained, in the following order: *g*4, *r*5, *q*6, *d*6, and obtain subsequent B-trees.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

10. Suppose a given algorithm requires two stacks *A* and *B*. *A* can hold a maximum of *m* elements and *B* can hold a maximum of *n* elements. Moreover, overflow occurs when either stack *A* is full or stack *B* is full, or both are full. Similarly, underflow occurs if at least either of the stacks is empty. Devise a scheme to perform insertion and deletion operations in *A* and *B*.
11. Consider a sequence *S* of $n \geq 23$ elements to perform *ShellSort*. Choose appropriate data structure(s) and necessary assumptions (like at least two pairs of diminishing increments) for the said purpose and make clear why and how the data structure(s) is (are) suitable.
12. Consider a binary search tree and take necessary steps to make it an AVL tree, if needed. Perform deletion of elements from the AVL tree and make the tree AVL after deletion of each element from the tree. Choose appropriate data structure(s) for the said purpose and make clear why and how the data structure(s) is (are) suitable.
13. Consider the problem of incrementing *n*-digit binary integers and compute amortized cost, a_i of the problem in terms of *n*, if applicable. Choose appropriate data structure(s) for the said purpose and make clear why and how the data structure(s) is (are) suitable.
14. Let P be an $n \times n$ matrix that contains non-zero elements present only in seven diagonals, centring and including the major diagonal. If the elements in the band formed by these seven diagonals are represented row wise in an array Q, with P[1,1] being stored in Q[1], obtain an algorithm to determine the value of P[*i*, *j*], $1 \leq i, j \leq n$ from array Q. Choose appropriate data structure(s) for the said purpose, and make clear why and how the data structure(s) is (are) suitable.
15. Devise a scheme for searching an undirected graph in the following manner. The scheme starts at the root node (selecting some arbitrary node as the root node in the given graph of at least 24 nodes) and explores as far as possible along each branch before backtracking. How all these paths from the root node could be explored?
16. Write an algorithm to differentiate the edges of a directed graph following the notion of depth-first search, based on your sequence of visiting the vertices. Choose appropriate data structure(s) for the said purpose and make clear why and how the data structure(s) is (are) suitable.
17. Let X be an n × n matrix, where $6 \times n \times 16$, such that the elements in each row are in non-decreasing order but the elements in each column are in non-increasing order. Devise a decision tree structure based algorithm that finds the first three largest elements in X and their sequences in non-increasing order in a minimum number of comparisons.

TOPIC/SUBTOPIC:

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introductory problem solving Lab 1 to prepare for solving assignments.
2	Introductory problem solving Lab 2 to prepare for solving assignments.
3	Assignments 1-2
4	Assignments 3-4
5	Assignment 5

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

6	Assignment 6
7	Assignment 7
8	Assignments 8-9
9	Assignments 10-11
10	Walkthrough Assignments 1-11
11	Assignment 12
12	Assignment 13
13	Assignment 14
14	Assignments 15-16
15	Assignment 17
16	Walkthrough Assignments 12-17

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 1

NAME OF FACULTY: ANTIKA SINHA

PAPER:CSMP 105 (Object Oriented Systems) Practical

LECTURES ALLOTTED: 16P (3 hours each)

ALLOTTED SYLLABUS:

Module1: Introduction to OOPS; Abstraction, Encapsulation, Generalization.

Specialization, Functional decomposition vs Object oriented decomposition. Coupling cohesion, Modularity and hierarchy, Relationship among classes and objects. object, compile vs run time binding, generic programming.

Module 2: Overview of UML, SDLC phases and UML diagrams, Static UML diagrams: Class diagrams, Object diagrams, Component diagrams, Package diagrams, Composite diagrams. Dynamic UML diagram: Activity diagrams, Usecase diagrams, State diagrams, Sequence diagrams, Communication diagrams, Interaction overview diagrams.

Module 3: Design pattern basics, benefits; Creational pattern: Refections, Singleton, Object pool, Factory, Abstract Factory, Buider, Prototype. Structural pattern: Adapter, Bridge, Composite, Decorator, Flyweight, Facade, Proxy.

Behavioural pattern: Interpreter, Template method, Chain of responsibility, Command, Iterator, Mediator, Memento, Observer, State, Visitor, Strategy.

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Class diagram and examples.
2	Relationships, class diagram and examples.
3	Class and association, example and coding

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 1

NAME OF FACULTY: ANTIKA SINHA

PAPER:CSMP 105 (Object Oriented Systems) Practical

LECTURES ALLOTTED: 16P (3 hours each)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
4	Creational pattern question and example; day 1.
5	Creational pattern question and example; day 2.
6	Creational pattern question and example; day 3.
7	Creational pattern question and example; day 4. Discussion with previous pattern.
8	Structural pattern question and example; day 1.
9	Structural pattern question and example; day 2.
10	Structural pattern question and example; day 3.
11	Structural pattern question and example; day 4.
12	Structural pattern question and example; day 5.
13	Behavioural pattern question and example; day 1.
14	Behavioural pattern question and example; day 2.
15	Discussion class 1; UML diagram practice
16	Discussion class 2; UML diagram practice

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-III (PG)

NAME OF FACULTY: Dr. Samir Malakar

PAPER: CSME 301 (TH) [Image Processing and Pattern Recognition]

LECTURES ALLOTTED: 33 (2 hrs. each)

ALLOTTED SYLLABUS:

Module-1: Image Fundamentals: Analog and digital images, image sensing, and acquisition: Image formation, Sampling, and quantization, Color space: Color (RGB, CMYK, HSI) vs grey level images, Matrix representation and intensity modification of digital images, Pixel adjacency and distance measure, Arithmetic, logical and set operations, Image file formats, Fundamental steps in DIP, Applications, and state of the art in DIP.

Module-2: Transformation and Filtering: Point processing: Identity, image negatives, log transform, power law, contrast stretching, histogram equalization, and specification. **Spatial filtering:** Linear filters: max, min, mean, median; order statistics filters. **Frequency based transforms:** Low and high pass filter, DFT **Image restoration concept:** Noise models, Image denoising, and deblurring

Module-3: Image segmentation: Segmentation techniques, Threshold based segmentation, Importance of derivative and gradients in edge detection, Masks: Roberts, Prewitt, Sobel; Canny edge detection, Region growing, and Split-Merge algorithms, Clustering based techniques, basics of Hough transform.

Module-4: Image Compression: Compression basics: Lossless, lossy, compression ratio, image compression models, evaluation criteria of a compression scheme, **compression techniques:** Huffman encoding, Run length, Arithmetic encoding.

Module-5: Pattern recognition: Introduction and applications. **Feature extraction and reductions:** Histogram of Gradient (HoG), Principal Component Analysis (PCA). **Learning:** Supervised and unsupervised; **Clustering and Classification techniques:** K-Nearest Neighbor Classifier, Support Vector Machine, K-means algorithm, Density-based Clustering.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to Image Processing, Pattern Recognition, Applications of IP and PR, Image formation.
2	Sampling, and quantization Color space (RGB, CMYK, HSI) vs grey-level images.
3	Matrix representation and intensity modification of digital images, Pixel adjacency
4	Distance measure, Arithmetic, logical, and set operations.
5	Image file formats, Fundamental steps in DIP, Applications, and state of the art in DIP

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

6	Identity, image negatives, log transform, power law, contrast stretching
7	Histogram Processing, understanding, and equalization, and specification
8	Histogram equalization and specification with problem solving
9	Spatial filtering: Linear filters: max, min, mean, weighted mean.
10	Spatial filtering: Median and order statistics filters, Boundary and Corner pixels handling
11	Frequency domain transforms: Low and high pass filter
12	Frequency domain transforms: DFT
13	DFT Problem solving and Image restoration concept: Noise models, Image denoising, and deblurring
14	Image 1st and 2nd order derivatives, use of derivatives, image gradients, problem solving
15	Image derivative operators: Roberts, Prewitt, Sobel and Canny edge detection
16	Segmentation techniques: Threshold-based.
17	Global thresholding techniques: Iterative and Otsu's algorithm with problem solving
18	Local thresholding techniques: Niblack, Sauvola, and Bernes' algorithm
19	Image segmentation techniques: Region growing and Split-Merge algorithms.
20	Image segmentation techniques: X-Y cut algorithm, Vornoi method, concept of CNN based approach.
21	Clustering-based techniques image segmentation techniques
22	Hough transforms.
23	Practice problems discussion Lectures 14-22.
24	Compression basics: Lossless, lossy, compression ratio, image compression models, evaluation criteria of a compression scheme,
25	compression technique- Run length encoding, Huffman encoding
26	Compression techniques: Arithmetic encoding and problem solving.
27	Introduction and applications of Pattern Recognition, Histogram of Gradient (HoG)
28	Principal Component Analysis (PCA) and problem solving of HoG and PCA
29	Learning: Supervised and unsupervised; K-means algorithm
30	K-Nearest Neighbour Classifier, Density-based Clustering
31	Support Vector Machine
32	University question paper discussion session 1.
33	University question paper discussion Session 2.

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-I

NAME OF FACULTY: Dr. Samir Malakar

PAPER: CMSA-CC-1 (P)

LECTURES ALLOTTED: 16 (3 hrs. each)

ALLOTTED SYLLABUS:

Assignments

From Combinational Circuits

1. Implementation of different functions (SOP, POS) using basic (AND, OR, and NOT) logic gates.
2. Study and prove De-Morgan's Theorem.
3. Realization of Universal functions using NAND and NOR gates.
4. Implementation of half (2-bit) and full adder (3-bit) using basic (AND, OR, and NOT) and Universal logic gates (NAND & NOR).
5. Implementation of half (2-bit) and Full Subtractor (3-bit) using basic (AND, OR, and NOT) and Universal logic gates (NAND & NOR).
6. Design and implement a 1-Digit BCD adder using 7483/74283 and other necessary logic gates.
7. Design 4 to 1 multiplexer using basic or Universal logic gates and implement half and full adder/subtractor.
8. Design and implement half and full adder /subtractor and other functions using multiplexers 74151/74153 and other necessary logic gates.
9. Cascading of Multiplexers.
10. Design 2 to 4 decoder using basic or universal logic gates.
11. Study 74138 or 74139 and implement half and full Adder/Subtractor and other functions.
12. Implementation of 1-bit magnitude comparator using decoders (74138/74139) and other necessary logic gates.
13. Cascading of Decoders.
14. Study magnitude comparators 7485.
15. Design and construct magnitude comparator (2-bit) using basic (AND, OR & NOT) and universal (NAND/NOR) logic gates.
16. Design a display unit using a Common anode or cathode seven-segment display and decoders (7446/7447/7448)
17. Design and implement 4-input 3-output (one output as valid input indicator) priority encoder using basic (AND, OR & NOT) logic gates.
18. Study Priority Encoder IC 74147/74148.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

19. Design a parity generator and checker using basic logic gates

From Sequential Circuits

20. Realization of SR, D, JK Clocked/Gated, Level Triggered flip-flop using basic or Universal logic gates.
21. Conversion of flip-flops: D to JK, JK to D, JK to T, SR to JK, SR to D Flip-flop.
22. Design synchronous and asynchronous counters MOD-n (MOD-8, MOD-10) UP/ DOWN and connecting Seven Segment Display along with decoder for the display of counting sequence.
23. Construction of ODD/EVEN n-bit Synchronous Counter, where n is maximum 4.
24. n-bit binary arbitrary sequence synchronous counter where n is maximum 4.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Learning to Digital Labs associated Dos and Don'ts, apparatus and their utility and usage. Assignment 1.
2	Assignment 2.
3	Assignment 3.
4	Assignment 4.
5	Assignments 5-6.
6	Assignments 7-8.
7	Assignment 9.
8	Assignments 10-11.
9	Practice some more problems related to Assignments 1-11
10	Assignments 12-13.
11	Assignments 14-16.
12	Assignments 17-19.
13	Assignments 20-21.
14	Assignments 22-23.
15	Assignment 24.
16	Practice some more problems related to Assignments 12-24

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-I

NAME OF FACULTY: Sk Mohiuddin

PAPER: CMSA-CC2 (P)

LECTURES ALLOTTED: 16 (3 hrs. each)

ALLOTTED SYLLABUS:

Assignments

1. WAP to print the sum and product of digits of an integer.
2.WAP to reverse a number.
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 or not.
6.Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.
7. WAP to compute the factors of a given number.
8. Write a macro that swaps two numbers. WAP to use it.
9.WAP to print a triangle of stars as follows (take number of lines from user):

*
***
*****
****
****

10.WAP to perform following actions on an array entered by the user :
i) Print the even-valued elements
ii) Print the odd-valued elements
iii) Calculate and print the sum and average of the elements of array
iv) Print the maximum and minimum element of array
v) Remove the duplicates from the array
vi) Print the array in reverse order
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 using pointers.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

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 new operator.
16. Write a menu driven program to perform following operations on strings:
a) Show address of each character in string
b) Concatenate two strings without using strcat function.
c) Concatenate two strings using strcat function.
d) Compare two strings
e) Calculate length of the string (use pointers)
f) Convert all lowercase characters to uppercase
g) Convert all uppercase characters to lowercase
h) Calculate number of vowels
i) Reverse the string
17. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
18. WAP to display Fibonacci series (i) using recursion, (ii) using iteration.
19. WAP to calculate Factorial of a number (i) using recursion, (ii) using iteration.
20. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.
21. Write a menu-driven program to perform following Matrix operations (2-D array implementation): a) Sum b) Difference c) Product d) Transpose
22. Copy the contents of one text file to another file, after removing all whitespaces.
23. Write a function that reverses the elements of an array in place. The function must accept only one pointer value and return void.
24. 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.
25. Add two distances in meter kilometer system using structure.
26. Add two complex numbers using structures.
27. Calculate the difference between two time periods using structures.
These are only examples; more can be included related to the theory.
Use open source C compiler.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to C programming, and guiding the installation of the required software and dependencies. Learning about different menus and basic codes in C to be used in logic development.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

2	Assignment 1, 2, 3
3	Assignment 4, 5, 6
4	Assignment 7, 8, 9
5	Assignment 10, 11, 12
6	Assignment 13, 14, 15
7	Assignment 16
8	Assignment 16 (Continuing)
9	Practicing applications of Assignments 1-16
10	Assignment 17, 18, 19
11	Assignment 20, 21, 22
12	Assignment 23, 24
13	Assignment 25, 26, 27
14	Practicing applications of Assignments 17-27
15	Practicing old Lab question papers
16	A lab exam will be conducted

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-I

NAME OF FACULTY: SHILPA SAHA

PAPER: CMSA-CC2 (P)

LECTURES ALLOTTED: 16 (3 hrs. each)

ALLOTTED SYLLABUS:

Assignments

1. WAP to print the sum and product of digits of an integer.
2. WAP to reverse a number.
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 or not.
6. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.
7. WAP to compute the factors of a given number.
8. Write a macro that swaps two numbers. WAP to use it.
9. WAP to print a triangle of stars as follows (take number of lines from user):

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

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

    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 using pointers.
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.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

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 new operator.
16. Write a menu driven program to perform following operations on strings:
   a) Show address of each character in string
   b) Concatenate two strings without using strcat function.
   c) Concatenate two strings using strcat function.
   d) Compare two strings
   e) Calculate length of the string (use pointers)
   f) Convert all lowercase characters to uppercase
   g) Convert all uppercase characters to lowercase
   h) Calculate number of vowels
   i) Reverse the string
17. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
18. WAP to display Fibonacci series (i) using recursion, (ii) using iteration.
19. WAP to calculate Factorial of a number (i) using recursion, (ii) using iteration.
20. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.
21. Write a menu-driven program to perform following Matrix operations (2-D array implementation): a) Sum b) Difference c) Product d) Transpose
22. Copy the contents of one text file to another file, after removing all whitespaces.
23. Write a function that reverses the elements of an array in place. The function must accept only one pointer value and return void.
24. 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.
25. Add two distances in meter kilometer system using structure.
26. Add two complex numbers using structures.
27. Calculate the difference between two time periods using structures. These are only examples; more can be included related to the theory. Use open source C compiler.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to C programming, and guiding the installation of the required software and dependencies. Learning about different menus and basic codes in C to be used in logic development.
2	Assignment 1, 2, 3
3	Assignment 4, 5, 6
4	Assignment 7, 8, 9
5	Assignment 10, 11, 12
6	Assignment 13, 14, 15
7	Assignment 16

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

8	Assignment 16 (Continuing)
9	Practicing applications of Assignments 1-16
10	Assignment 17, 18, 19
11	Assignment 20, 21, 22
12	Assignment 23, 24
13	Assignment 25, 26, 27
14	Practicing applications of Assignments 17-27
15	Practicing old Lab question papers
16	A laboratory mock examination will be conducted

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-I

NAME OF FACULTY: TONMOY METE

PAPER: CMSA-CC2 (P)

LECTURES ALLOTTED: 16 (3 hrs. each)

ALLOTTED SYLLABUS:

Assignments

1. WAP to print the sum and product of digits of an integer.
2. WAP to reverse a number.
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 or not.
6. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.
7. WAP to compute the factors of a given number.
8. Write a macro that swaps two numbers. WAP to use it.
9. WAP to print a triangle of stars as follows (take number of lines from user):

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

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

    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 using pointers.
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.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

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 new operator.
16. Write a menu driven program to perform following operations on strings:
   a) Show address of each character in string
   b) Concatenate two strings without using strcat function.
   c) Concatenate two strings using strcat function.
   d) Compare two strings
   e) Calculate length of the string (use pointers)
   f) Convert all lowercase characters to uppercase
   g) Convert all uppercase characters to lowercase
   h) Calculate number of vowels
   i) Reverse the string
17. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
18. WAP to display Fibonacci series (i) using recursion, (ii) using iteration.
19. WAP to calculate Factorial of a number (i) using recursion, (ii) using iteration.
20. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.
21. Write a menu-driven program to perform following Matrix operations (2-D array implementation): a) Sum b) Difference c) Product d) Transpose
22. Copy the contents of one text file to another file, after removing all whitespaces.
23. Write a function that reverses the elements of an array in place. The function must accept only one pointer value and return void.
24. 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.
25. Add two distances in meter kilometer system using structure.
26. Add two complex numbers using structures.
27. Calculate the difference between two time periods using structures. These are only examples; more can be included related to the theory. Use open source C compiler.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to C programming, and guiding the installation of the required software and dependencies. Learning about different menus and basic codes in C to be used in logic development.
2	Assignment 1, 2, 3
3	Assignment 4, 5, 6
4	Assignment 7, 8, 9
5	Assignment 10, 11, 12
6	Assignment 13, 14, 15
7	Assignment 16

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

8	Assignment 16 (Continuing)
9	Practicing applications of Assignments 1-16
10	Assignment 17, 18, 19
11	Assignment 20, 21, 22
12	Assignment 23, 24
13	Assignment 25, 26, 27
14	Practicing applications of Assignments 17-27
15	Practicing old Lab question papers
16	A laboratory mock examination will be conducted

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-I

NAME OF FACULTY: Sk Mohiuddin

PAPER: CC-2 (TH)

LECTURES ALLOTTED: 15 (1.5 Hours per Lecture)

ALLOTTED SYLLABUS:

Introduction:
History, Basic Structure, Algorithms, Structured programming constructs.

C Preprocessor:
File inclusion, Macro substitution.

Arrays:
String handling with arrays, String handling functions.

User defined Data types:
Enumerated data types, Structures. Structure arrays, Pointers to Functions and Structures, Unions.

File Access:
Opening, Closing, I/O operations.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	History, Basic Structure, Structured programming constructs
2	Definition and properties of Algorithms. Problem solving through algorithm.
3	File inclusion, Macro substitution (advantages and disadvantages) with real applications.
4	Home task checking and programming logic development through algorithm.
5	String handling with 1D & 2D arrays, use of string handling library functions.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

6	Problem solving of previous lectures.
7	Enumerated data types, Structures, Structure arrays.
8	Problem solving of previous lectures.
9	Pointers to Functions and Structures, Unions.
10	Problem solving of previous lectures.
11	Opening, Closing, I/O operations
12	Problem solving of previous lectures.
13	Discussion on Home task for self-learning and new Problem solving
14	University questions Discussion.
15	Doubt clearing class.

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER I

NAME OF FACULTY: SHILPA SAHA

PAPER: PROGRAMMING FUNDAMENTALS USING C (CC-2-TH)

LECTURES ALLOTTED: 12 (1.5 Hours per Lecture)

ALLOTTED SYLLABUS:

Introduction: History, Basic Structure, Algorithms, Structured programming constructs.

C Programming elements: Character sets, Keywords, Constants, Variables, Data Types, Operators: Arithmetic, Relational, Logical and Assignment; Increment and Decrement and Conditional, Operator Precedence and Associations; Expressions, type casting. Comments, Functions, Storage Classes, Bit manipulation, Input and output.

Statements: Assignment, Control statements- if, if else, switch, break, continue, goto, Loops-while, do while, for.

Functions: Argument passing, return statement, return values and their types, recursion.

Pointers: Definition and initialization, Pointer arithmetic, Pointers and arrays, String functions and manipulation, Dynamic storage allocation.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to C- Programming
2	Continuation of introduction to C- Programming
3	C-Programming Elements (Keywords, Constants, Data Type)
4	C-Programming Elements (Operators, Input and Output)
5	Control Statement (If, If Else)
6	Control Statement (Loops, Switch, Break)

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

7	Continuation of Control Statement (Loops, Switch, Break)
8	Functions (Argument Passing, Return Statement, Recursion)
7	Continuation of Lecture 8
9	Pointers (Definition, Initialization, Pointer Arithmetic, Dynamic Storage Allocation)
10	Continuation of Lecture 9
11	Continuation of Lecture 9
12	Continuation of Lecture 9
13	University Question Answer Discussion

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE
TEACHING PLAN FOR SEMESTER-III

NAME OF FACULTY: TONMOY METE

PAPER: CMS-A-CC-3-6-P

LECTURES ALLOTTED: 14 (3 Hrs. each)

ALLOTTED SYLLABUS:

1. Implement Newton's forward and backward interpolation algorithm
2. Implement Lagrange's interpolation algorithm
3. Implement trapezoidal and Simpson's 1/3 rule to evaluate integral like for finite a and b
4. Implement Bisection Algorithm to find out a root of an algebraic and transcendental equation
5. Implement Newton-Raphson and Regula-Falsi Algorithm to find out a root of an algebraic and transcendental equation
6. Implement Gauss elimination Algorithm to find out solution of a system of linear equations
7. Implement Gauss -Jacobi Algorithm to find out solution of a system of linear equations
8. Implement Gauss -Seidel Algorithm to find out solution of a system of linear equations
9. Implement Gauss -Jordan Algorithm to find out solution of a system of linear equations and to find out the inverse of a square matrix

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Assignment 1
2	Continuation of Assignment 1
3	Assignment 2
4	Assignment 3
5	Assignment 4
6	Assignment 5
8	Continuation of Assignment 5
9	Assignment 6
10	Assignment 7
11	Assignment 8
12	Assignment 9
13	Practice Lab.
14	Mock Lab Test

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER III

NAME OF FACULTY: TONMOY METE

PAPER: Computational Mathematics (CC 6)

LECTURES ALLOTTED: 50 Hrs

ALLOTTED SYLLABUS:

Introduction: (05 hours) Sets - finite and Infinite sets, uncountable Infinite Sets; functions, relations, Properties of Binary Relations, Closure, Partial Ordering Relations; counting - Pigeonhole Principle, Permutation and Combination; Mathematical Induction, Principle of Inclusion and Exclusion.

Growth of Functions: (05 hours) Asymptotic Notations, Summation formulas and properties .

Recurrence Relations, generating functions, Linear Recurrence Relations with constant coefficients and their solution, Substitution Method, Recurrence Trees

Numerical Methods: (20 hours) Errors in Approximate Calculations: Mathematical Preliminaries, Approximate and Rounding of Numbers, Significant figures, Error and their computation, Propagation of error, Percentage of error. Interpolation: Newton Forward and Backward interpolation, Lagrange interpolation. Solving Set of Linear Equations: Gaussian Elimination, Gauss– Jordan Elimination, Iteration method & its convergence condition and testing - Gauss-Seidel Iteration, Gauss Jacobi Iterative Methods and different types of convergence, divergence. Solving Non-linear equations: Bisection method, Regula-falsi method, Secant and Newton Raphson method Solving Differential Equations: Euler Method, Runge-Kutta second and fourth order method Numerical Integration: Trapezoidal and Simpson's 1/3rd Rules. Line fitting: Linear, Quadratic fit,

Introduction to Probability Elementary events, Sample space, Classical and Axiomatic definition of Probability, Theorems on Total Probability, Conditional Probability, Bernoulli Trials and Binomial Distribution, Bayes' Theorem, Random Variables, Expectation, Variance, Standard Deviation

Graph Theory (20 hours) Basic Terminology, Models and Types, Multi graphs and Weighted graphs, Graph Representation, Graph Isomorphism, Connectivity, Euler and Hamiltonian Paths and Circuits, Planar Graphs, Graph Coloring, Trees, Basic Terminology and properties of Trees, Introduction to Spanning Trees

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

TOPIC/SUBTOPIC: Introduction:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Sets - finite and Infinite sets, uncountable Infinite Sets; functions
2	Relations, Properties of Binary Relations, Closure, Partial Ordering Relations
3	Counting - Pigeonhole Principle, Permutation and Combination; Mathematical Induction, Principle of Inclusion and Exclusion
4	Cntd..
5	Cntd..
6	Cntd..

TOPIC/SUBTOPIC: Growth of Functions:	
7	Asymptotic Notations, Summation formulas and properties, Bounding Summations
8	Cntd..
9	Cntd..
10	Cntd..
TOPIC/SUBTOPIC: Recurrence Relation	
11	Recurrence Relations, generating functions, Linear Recurrence Relations with constant coefficients and their solution Substitution Method, Recurrence Trees
12	Cntd..
13	Cntd..
14	Cntd..
15	Cntd..
16	
17	Errors in Approximate Calculations: Mathematical Preliminaries, Approximate and Rounding of

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

	Numbers, Significant figures, Error and their computation, Propagation of error, Percentage of error. Interpolation: Newton Forward and Backward interpolation, Lagrange interpolation
18	Cntd..
19	Cntd..
20	Cntd..
21	Solving Set of Linear Equations: Gaussian Elimination, Gauss– Jordan Elimination, Iteration method & its convergence condition and testing - Gauss-Seidel Iteration, Gauss Jacobi Iterative Methods and different types of convergence, divergence
22	Cntd..
23	Cntd..
24	Cntd..
25	Cntd..
26	Cntd..
27	Introduction to Probability Elementary events, Sample space, Classical and Axiomatic definition of Probability, Theorems on Total Probability, Conditional Probability, Bernoulli Trials and Binomial Distribution, Bayes' Theorem, Random Variables, Expectation, Variance, Standard Deviation
28	Cntd..
29	Cntd..
30	Cntd..
31	Cntd..
32	Cntd..
33	
34	Terminology, Models and Types, Multi graphs and Weighted graphs, Graph Representation, Graph Isomorphism, Connectivity, Euler and Hamiltonian Paths and Circuits, Planar Graphs, Graph Coloring, Trees, Basic Terminology and properties of Trees, Introduction to Spanning Trees
35	Cntd..

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

36	Cntd..
37	Cntd..
38	Cntd..
39	Cntd..
40	Cntd..

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 3

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-3-7-P (Shell programming in LINUX)

LECTURES ALLOTTED: 16P (3 hours each)

ALLOTTED SYLLABUS: Shell programming in LINUX (Group 2)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to shell programming, types of shell, file extension, how to run program in shell.
2	Basic commands and their functions, basic arithmetic perform. Input taking and output printing. Write a shell script to perform various arithmetic operations, expression.
3	Conditions, syntax, break. Write a shell script to understand different patterns and use of break, condition statement.
4	Conditions, syntax, break. Loop (for, while etc.) examples and practice, Write a shell script to find out the factorial of a given number.
5	Conditions, loop practice Write a shell script to find out if a given number is prime or not. Write a shell script to find out if values in a range are prime or not.
6	Conditions, Write a shell script to find the roots of a quadratic equation, considering all possible cases. Introduction to array, how to scan and print array values.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 3

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-3-7-P (Shell programming in LINUX)

LECTURES ALLOTTED: 16P (3 hours each)

Shell programming in LINUX (Group 2)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
7	Revise class day 1
8	Write a shell script to find a number using linear search technique. Write a shell script to find a number using binary search technique. Algorithm of those are discussed.
9	Write a shell script to sort a set of integer numbers using bubble sort or any sort you remember.
10	Introduction to string processing, cut, wc command with examples. Write a shell script to count the words, lines and characters of a given file. File name should be provided at run time.
11	Write a shell script to convert the content of a file from lower case to upper case. File read, write with examples. Related commands etc. tr, grep,
12	Write a shell script that gets executed at the moment of user login and it displays Good Morning, Good afternoon, Good Evening, Good Night, depending upon the time at which the user logs on. Also use different commands.
13	Write a shell script that take a word from user and find out the frequency of the word in a given file.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 3

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-3-7-P (Shell programming in LINUX)

LECTURES ALLOTTED: 16P (3 hours each)

Shell programming in LINUX (Group 2)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
14	Other sorting examples in shell script.
15	File operations with; without commands.
16	Revise class day 2

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-III

NAME OF FACULTY: TONMOY METE

PAPER: CMS-A-CC-3-7-P

LECTURES ALLOTTED: 14 (3 Hrs. per Lab)

ALLOTTEDSYLLABUS:

1. Write a shell script to convert the content of a file from lower case to upper case.
2. Write a shell script to count the words, lines and characters of a given file. File name should be provided at run time.
3. Write a shell script that take a word from user and find out the frequency of the word in a given file.
4. Write a shell script that gets executed at the moment of user login and it displays Good Morning, Good afternoon, Good Evening, Good Night, depending upon the time at which the user logs on.
5. Write a shell script to print Pascal diamond.
6. Write a shell script to find a number using sequential search method.
7. Write a shell script to find a number using binary search technique.
8. Write a shell script to sort a set of integer numbers using bubble sort.
9. Write a shell script to find out the factorial of a given number.
10. Write a shell script to reverse a string and check whether it is a palindrome.
11. Write a shell script to find the roots of a quadratic equation ax2 + bx +c = 0, considering all possible cases.
12. Write a shell script for menu based system to insert records for employees with employee ID, name, designation, salary in a data file, also display records when necessary. Display salary for the employee asked.

Lec. No.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introductory class related to Lab Assignment
2	Assignments 1-2
3	Assignment 3
4	Assignment 4
5	Assignment 5
6	Assignment 6
7	Assignment 7

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

8	Assignment 8
9	Assignment 9
10	Assignment 10
11	Assignment 11
12	Assignment 12
13	Practice Lab
14	Most Lab Test

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 3

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-3-7-TH (Operating System)

LECTURES ALLOTTED: 16P (1.5 hour each)

ALLOTTED SYLLABUS:

Introduction Basic OS functions, types of operating systems- batch processing, multiprogramming, time sharing, multiprocessing, distributed and real time systems.
Operating System Organization Processor and user modes, kernels, system calls and system programs.
Memory Management Physical and logical address space; memory allocation strategies – fixed and variable partitions, paging, segmentation, virtual memory
File and I/O Management Directory structure, file operations, file allocation methods, disk management.
Protection and Security Policy mechanism, Authentication

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 3

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-3-7-TH (Operating System)

LECTURES ALLOTTED: 16P (1.5 hour each)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Basic OS functions, types of operating systems- batch processing, multiprogramming.
2	time sharing, multiprocessing, distributed and real time systems.
3	Processor and user modes
4	kernels, system calls and system programs.
5	how many types of allocations are available; compile time, run time with issues.
6	Physical and logical address space; dynamic loading.
7	Basic memory allocation hardware, registers base limit with example.
8	memory allocation strategies – first, best and worst fit strategies with example, problem solution. fixed and variable partitions and problem discussion.
9	Fragmentation problem, paging and problem discussion of TLB.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 3

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-3-7-TH (Operating System)

LECTURES ALLOTTED: 16P (1.5 hour each)

10	Fragmentation problem, segmentation technique with example. Advantages, disadvantages. Paging vs segmentation technique.
11	combining paging, segmentation; logical diagram.
12	Introduction to virtual memory and how performed. What is page fault. How to handle it.
13	Different page replacement techniques; FIFO technique with example. Optimal page replacement technique, LRU with examples.
14	file, directories, hierarchy. Seek time, disk scheduling algorithms: FCFS with examples.
15	SSTF, SCAN technique with examples. C-SCAN technique with examples. Comparison. File operations.
16	Malware, protection, security mechanism.

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER III

NAME OF FACULTY: Tonmoy Mete

PAPER: Operating Systems(CC 7)

LECTURES ALLOTTED: 39 Hrs

ALLOTTED SYLLABUS:

Introduction Basic OS functions, types of operating systems- batch processing, multiprogramming, time sharing, multiprocessing, distributed and real time systems.

Operating System, Organization Processor and user modes, kernels, system calls and system programs.

Process System view of the process and resources, process control block, I/O and CPU bound process, process hierarchy, concept of threads Process Scheduling: Preemptive and non-preemptive scheduling, Long term scheduling, short term/CPU scheduling (FCFS, SJF, SRJF, RR and priority) and medium term scheduling Process Synchronization: Concurrent processes, critical section, semaphores and application, methods for inter-process communication;

Deadlock: Definition, Prevention, Avoidance, Detection, Recovery.

TOPIC/SUBTOPIC: Introduction:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction Basic OS functions, types of operating systems- batch processing, multiprogramming, time sharing, multiprocessing, distributed and real time systems.
2	Cntd..
3	Cntd..
4	Cntd..
TOPIC/SUBTOPIC: Operating System Organization	
5	Processor and user modes, kernels, system calls and system programs.
6	Cntd..
7	Cntd..

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

8	Cntd..
TOPIC/SUBTOPIC: Process	
9	System view of the process and resources, process control block, I/O and CPU bound process, process hierarchy, concept of threads Process Scheduling: Preemptive and non-preemptive scheduling, Long term scheduling, short term/CPU scheduling (FCFS, SJF, SRJF, RR and priority) and medium term scheduling Process Synchronization: Concurrent processes, critical section, semaphores and application, methods for inter-process communication;
10	Cntd..
11	Cntd..
12	Cntd..
13	Cntd..
14	Cntd..
15	Cntd..
16	Cntd..
17	Cntd..
18	Cntd..
TOPIC/SUBTOPIC: Deadlock	
19	Definition, Prevention, Avoidance, Detection, Recovery
20	Cntd..
21	Cntd..
22	Cntd..
23	Cntd..
24	Cntd..

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-III

NAME OF FACULTY: Sk Mohiuddin

PAPER: SEC-A (TH)

LECTURES ALLOTTED: 15 (1.5 Hours per Lecture)

ALLOTTED SYLLABUS:

Introduction Basic concepts of Graphics Devices: CRT monitor, Monochrome and Color Monitor displaying technique only, Physical and logical units of graphics devices – Pixel and its different properties, Basic idea for image or picture formation using pixels – Raster Scan and Vector Scan.

Basic geometrical shapes formation algorithms Concepts: Co-ordinate System, Line Segment, Digital Differential Analyzer, Circle and arc segment, elliptic segment, Bresenham's and Midpoint scan conversion algorithms.

Projection: Basic Concept of Projection operation and its application, Classification – Perspective, Parallel and its subclasses, Principles of these projections (Geometric representation only, no Mathematical Foundation and algorithms)

Applications: Basic Concepts Computer Art, Animation – Animating and modeling of real world, Morphing – Classification of morphing and Application to the Advertisements and publicities.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	CRT monitor, Monochrome and Color Monitor displaying technique only, Physical and logical units of graphics devices- Pixel
2	Pixel different properties, Basic idea for image or picture formation using pixels – Raster Scan and Vector Scan.
3	Co-ordinate System, Derivation of all line drawing algorithms like DDA, Mid-point and Bresenham's with problem solving.
4	Midpoint circle and Bresenham's circle drawing algorithm with problem discussion.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

5	Midpoint ellipse and Bresenham's ellipse drawing algorithm with problem discussion.
6	Problem solving of previous lectures.
7	Basic Concept of Projection operation and its application, Classification – Perspective, Parallel and its subclasses.
8	Principles of these projections (Geometric representation only, no Mathematical Foundation and algorithms).
9	Assignment Checking and Discussion.
10	University questions Discussion to date.
11	Basic Concepts Computer Art, Animation – Animating and modelling of real world.
12	Morphing – Classification of morphing and Application to the Advertisements and publicities.
13	Discussion on Home task for self-learning and new Problem solving
14	University questions Discussion.
15	Doubt clearing class.

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-III

NAME OF FACULTY: Dr. Samir Malakar

PAPER: CMSA-SEC-A-1 (TH)

LECTURES ALLOTTED: 15 (1.5 hrs. each)

ALLOTTED SYLLABUS:

Two and Three Dimensional Transformations
Transformations operations - Translation, Rotation, Scaling. Reflection, Shearing, and Inverse of these operations, Homogeneous coordinate system representation, matrix representation.

Composite Transformations Operations – Basic ideas and matrix representations by matrix concatenation for a particular operation.

Two Dimensional Clipping
Viewport, window port, display device, Point Clipping, Line Clipping, Cohen-Sutherland line clipping algorithm, Sutherland Hudgeman polygon clipping algorithm.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to Transformations operations - Translation, Rotation, Scaling
2	Mathematical derivations: Transformations operations - Translation, Rotation, Scaling.
3	Problem Solving of Transformations operations - Translation, Rotation, Scaling.
4	Introduction to Homogeneous coordinate system representation
5	Further understanding and Problems of Homogeneous coordinate system representation
6	Understanding Matrix representation
7	Problem solving of previous lectures
8	Basic ideas and matrix representations by matrix concatenation for a particular operation and introduction and understanding of Viewport, window port, the display device

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

9	Home task Checking and Discussion
10	University questions Discussion to date
11	Point Clipping, Line Clipping
12	Cohen-Sutherland line clipping algorithm
13	Sutherland Hudgeman polygon clipping algorithm
14	Discussion on Home task for self-learning and new Problem solving
15	University questions Discussion

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OFCOMPUTER SCIENCE

TEACHING PLANFOR SEMESTER V

NAME OF FACULTY:SHILPA SAHA

PAPER:DATABASE MANAGEMENT SYSTEM (CC11-P)

LECTURES ALLOTTED: 12(3 hrs. each)

ALLOTTEDSYLLABUS:

RDBMS Lab using My SQL & PHP

Assignments

1. Write PHP scripts to understand the following: Data types, variables, global array, parameter scop, object, type cast, control statements, switch case, loop (for, do-while, while, foreach), multidimensional array, associative array, indexed array.
2. Create a table "Student" in MySQL data base containing the fields name, roll, city, email and date_of_birth through PHP script. Now insert 5 records into the same table and display them through PHP script.
3. Write a PHP script to insert the records in the table in Q-2 and display the records in a separate table of all students who are born in between 01/01/2000 to 31/12/2005.
4. Design a HTML form to take a valid email from user and search the corresponding student from the database using PHP script and display the details of that student in tabular form.
5. Design a login table to take username and password. Show all records of the Student table for an authenticate user. A user being authenticate if the username and password exists in the MYSQL database "Login" table.
6. Design a login form and check valid username and password to display student details using PHP script. Also write a PHP script to change username and password depending on old password.
7. Write PHP script to insert, delete and update records in a table.
8. Suppose a table "Food_Details" containing the fields Food_items and Price_per_item. Design a menu to select different food items and input the quantity ordered by customer. Generate a bill containing Customer name, Food items, quantity, price and Total price. Net price should be the total price plus 15% GST of total price.
9. Create a table as Q-7. Create another table "Customer_details" containing the fieldscustomer_name, total_amount_paid, date_of_payment. Design a menu to select different food items and input the quantity ordered by customer. Generate a bill containing Customer name, Food items, quantity, and Total price. Also insert the record i.e. customer name, total amount paid and date of payment in "Customer_details" table. Net price should be the total price plus 15% GST of total price.
10. Suppose a table "Salary" contained the fields EmpName, BasicPay, HRA, DA and Professional_tax. Record should exists only for EmpName and BasicPay. Design a HTML form to take input for HRA percentage, DA percentage, and Professional tax. Now write a PHP script to generate the DA, HRA and Professional tax of every employee and store them into Salary table with respect to every employee. Now display the records.
11. Design a HTML form to take inputs from user and store the records into a table "Employee" using PHP script containing the following fields. Fields Form input control Ename------textbox Address-----textareaPhno-------textbox Salary-----textbox Category(GEN,SC,ST,OBC)-----radio buttons Language-----checkbox (Multiple languages have to be concatenate into a string separated by commas and then store into database like "Bengali, English, Hindi")
12. Write a PHP script to display the employee records of the above "Employee" table order by user's choice field. The field has to be choices through drop down menu containing all fields of the table.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

13. Create a table "Sports" in MySQL data base containing the fields Players, TestRuns, ODIRuns, T20IRuns. Insert and display the record with total individual runs of every player (like TestRun+ODIRun+T20IRun) through PHP script.
14. Display the record of highest run scorer in Test or T20I or ODI according to user's choice through a drop down menu for Q-13 table. Drop down menu contains the fields name TestRuns, ODIRuns, T20IRuns.
15. Design a HTML form to take records from user for the above table "Sports". Now write PHP script to insert, update and delete records through PHP script.
16. Design a form to take input from user and store into a table containing the fields Name,city, phno, email, password. Write a PHP script to take input and store into the table such that Phno and mail id of every person must be unique.
17. Create a MySQL database table "Employee" with fieldsename, eid, salary dept and dob. Perform all database operations like select, insert, delete and update through PHP.

Create a table "Marks" with the fieldsstdname, roll, CompScMarks, PhysicsMarks, ChemistryMarks. Design a form to Insert records into database and display records with grade using PHP script. m=average marks of all subjects. 80≤m≤100----grade-A 60≤m

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	XAMPP SERVER INTRODUCTION
2	SQL (TABLE CREATION,DATA INSERTION,DISPLAY TABLE)
3	SQL(JOINING,FUNCTIONS)
4	SQL (QUERIES)
5	SQL (SUBQUERIES)
6	ASSIGNMENT 1,2
7	ASSIGNMENT 3,4,5
8	ASSIGNMENT 6,7
9	ASSIGNMENT 8,9,10
10	ASSIGNMENT 11,12
11	ASSIGNMENT 13,14
12	ASSIGNMENT 15,16,17

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OFCOMPUTER SCIENCE

TEACHING PLANFOR SEMESTER V

NAME OF FACULTY:SHILPA SAHA

PAPER: DATABASE MANAGEMENT SYSTEM (CC11-T)

LECTURES ALLOTTED: 5 (1.5 hrs each)

ALLOTTEDSYLLABUS:

Introduction Drawbacks of Legacy System; Advantages of DBMS; Layered Architecture of Database, Data Independence; Data Models; Schemas and Instances; Database Languages; Database Users, DBA; Data Dictionary.

Entity Relationship(ER) Modeling Entity, Attributes and Relationship, Structural Constraints, Keys, ER Diagram of Some Example Database, Weak and strong Entity Set, Specialization and Generalization, Constraints of Specialization and Generalization, Aggregation.

SQL Basic Structure, Data Definition, Constraints and Schema Changes; Basic SQL Queries (Selection, Insertion, Deletion, Update); Order by Clause; Complex Queries, Aggregate Function and Group by Clause; Nested Sub Queries; Views, Joined Relations; Set Comparisons (All, Some); Derived Relations.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	DBMS INTRODUCTION (ADVANTAGES OF DBMS,DBMS ARCHITECTURE)
2	DATABASE LANGUAGES,DBA
3	DATA MODELS(HIERARCHICAL,NETWORK,RELATIONAL)
4	SQL
5	ER MODEL

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 5

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-5-12-P: Object Oriented Programming System (OOPs)

LECTURES ALLOTTED: 16P (3 hours each)

ALLOTTED SYLLABUS:

Object Oriented Programming System (OOPs) Practical. (For Group 2 students)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Javac, java, path. Running JAVA program. Main function. Write a program in java that sorts half of element in ascending and rest half of the elements in descending order.
2	Write a java program to compare two strings lexicographically.
3	Write a Java method to count all words in a string. Test Data: Input the string: The quick brown fox jumps over the lazy dog. Expected Output: Number of words in the string: 9
4	Write a program in java that accepts a 2D matrix and prints the matrix with row minimum and column minimum values. Also perform matrix operations: transpose, addition.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 5

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-5-12-P: Object Oriented Programming System (OOPs)

LECTURES ALLOTTED: 16P (3 hours each)

ALLOTTED SYLLABUS:

Object Oriented Programming System (OOPs) Practical. (For Group 2 students)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
5	Write a program in java to delete all consonants from an input string and print the result string. A class called MyPoint, which models a 2D point with x and y coordinates. It contains: • Two instance variables x (int) and y (int). • A default (or "no-argument" or "no-arg") constructor that construct a point at the default location of (0,0).
6	• A overloaded constructor that constructs a point with the given x and y coordinates. • A method setXY() to set both x and y. • A method getXY() which returns the x and y in a 2-element int array. • A toString() method that returns a string description of the instance in the format "(x, y)". • A method called distance(int x, int y) that returns the distance from this point to another point at the given (x, y) coordinates, Write the MyPoint class. Also write a test driver (called TestMyPoint) to test all the public methods defined in the class.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 5

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-5-12-P: Object Oriented Programming System (OOPs)

LECTURES ALLOTTED: 16P (3 hours each)

ALLOTTED SYLLABUS:

Object Oriented Programming System (OOPs) Practical. (For Group 2 students)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
7	Create a superclass 'Person' and two subclasses 'Student' and 'Staff'. The following are the instance variables and methods: a. For 'Person' instance variables: name:String, address:String. Initiate variable through constructor, incorporate one method setPerson() that updates Person variables , another method tostring() that shows Person details as "Person[name=?,address=?". b. For 'Student' sub class instance variables: program:String, year:String, fees:double. Initiate both 'Student' and 'Person' variables through constructor, incorporate one method setStudent() that updates both student and 'Person' data, another method tostring() that shows 'Person-Student' details as "Person[name=?,address=?,Program=?,Year=?,Fees=?".
8	Consider you are designing vehicles engine with 'speed:int, gear:int'. you can define your engine functionalities 'speedUp(value)' and 'changeGear(value) in an interface. The class which is implementing the interface should implement all the methods in the interface.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 5

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-5-12-P: Object Oriented Programming System (OOPs)

LECTURES ALLOTTED: 16P (3 hours each)

ALLOTTED SYLLABUS:

Object Oriented Programming System (OOPs) Practical. (For Group 2 students)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
9	c. For 'Staff' subclass instance variables: school:String, pay:double. Initiate both 'Staff' and 'Person' variables through constructor, incorporate one method setStaff() that updates both 'staff' and 'Person' data, another method tostring() that shows 'Person-Staff' details as "Person[name=?,address=?,School=?,Pays=?". Write the classes and a test driver main class to test all functions mentioned above. 6. Create a base class 'Square' having instance variable side:double. Initiate variable using constructor, a method 'getVolume() : double' that calculates volume and print it. Create a derived class 'Cylinder' having instance variable height:double. Initiate variables of both classes through constructor, override method 'getVolume() : double' to calculate volume of cylinder taking 'side' variable of base class as 'radius' and print it.
10	Write a program in java that handles both 'ArrayIndexOutOfBoundsException' and 'ArithmeticException'.
11	Write a program to create your own exception as NegativeSizeException whenever negative values are put in an array.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 5

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-5-12-P: Object Oriented Programming System (OOPs)

LECTURES ALLOTTED: 16P (3 hours each)

ALLOTTED SYLLABUS:

Object Oriented Programming System (OOPs) Practical. (For Group 2 students)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
12	Create a class Student with following operations a) create parameterized constructor to initialize the objects. b) create a function isEqual() to check whether the two objects are equal or not which returns the Boolean value and gets two objects. c) print the result in main method if objects are equals or not (take variables as your assumption).
13	Create an abstract class employee, having its properties and abstract function for calculating net salary and displaying the information. Derive manager and clerk class from this abstract class and implement the abstract method net salary and override the display method.
14	Write JAVA program to create thread using two different approaches, priority, join.
15	Write a Java program to design application (form) having suitable GUI component using awt, swing.
16	Write Java program to access database (insertion, deletion, updation operations) using JDBC connection.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER

NAME OF FACULTY: SAGARIKA KAR CHOWDHURY

PAPER: CC12 (P)

LECTURES ALLOTTED:

ALLOTTED SYLLABUS:

Write a program in java that sorts half of element in ascending and rest half of the elements in descending order.
2. Write a program in java that accepts a 2D matrix and prints the matrix with row minimum and column minimum values.
4 3 5 3
1 0 7 0
8 4 6 4
1 0 5
3. Write a program in java to delete all consonants from an input string and print the result string.

4. A class called MyPoint, which models a 2D point with x and y coordinates. It contains:
• Two instance variables x (int) and y (int).
• A default (or "no-argument" or "no-arg") constructor that construct a point at the default location of (0, 0).
• A overloaded constructor that constructs a point with the given x and y coordinates.
• A method setXY() to set both x and y.
• A method getXY() which returns the x and y in a 2-element int array.
• A toString() method that returns a string description of the instance in the format "(*x*, *y*)".
• A method called distance(int x, int y) that returns the distance from *this* point to another point at the given (x, y) coordinates, Write the MyPoint class. Also write a test driver (called TestMyPoint) to test all the public methods defined in the class.

5. Create a superclass 'Person' and two subclasses 'Student' and 'Staff'. The following are the instance variables and methods:
a. For 'Person' instance variables: *name:String, address:String.* Initiate variable through constructor, incorporate one method setPerson() that updates Person variables , another method tostring() that shows Person details as "Person[name=?,address=?".
b. For 'Student' sub class instance variables: *program:String, year:String, fees:double.* Initiate both 'Student' and 'Person' variables through constructor, incorporate one method setStudent() that updates both student and 'Person' data, another method tostring() that shows 'Person-Student' details as "Person[name=?,address=?,Program=?,Year=?,Fees=?".
c. For 'Staff' subclass instance variables: *school:String, pay:double.* Initiate both 'Staff' and 'Person' variables through constructor, incorporate one method setStaff() that updates both 'staff' and 'Person' data, another method tostring() that shows 'Person-Staff' details as "Person[name=?,address=?,School=?,Pays=?".
Write the classes and a test driver main class to test all functions mentioned above.
6. Create a base class 'Square' having instance variable *side:double.* Initiate variable using constructor, a method

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

'getVolume() : double' that calculates volume and print it. Create a derived class 'Cylinder' having instance variable *height:double.* Initiate variables of both classes through constructor, override method 'getVolume() : double' to calculate volume of cylinder taking 'side' variable of base class as 'radius' and print it.

7. Consider you are designing vehicles engine with '*speed:int, gear:int'*. you can define your engine functionalities 'speedUp(value)' and 'changeGear(value) in an interface. The class which is implementing the interface should implement all the methods in the interface.

8. Write a program in java that handles both 'ArrayIndexOutOfBoundsException' and 'ArithmeticException'.
9. Write a program in java that inputs students data(Regno, Sname, City, ContactNo) from user and insert into table 'Student_info' using JDBC connectivity. Also view all records in tabular format.

10. Write a Java program to remove a specific element from an array.
11. Write a Java program to insert an element (specific position) into an array.
12. Write a Java program to find all pairs of elements in an array whose sum is equal to a specified number.
13. Write a Java program to remove the duplicate elements of a given array and return the new length of that array.
14. Write a Java program to find the length of the longest consecutive elements sequence from a given unsorted array of integers.

Sample array: [49, 1, 3, 200, 2, 4, 70, 5]
The longest consecutive elements sequence is [1, 2, 3, 4, 5], therefore the program will return its length 5.
15. Write a java program to compare two strings lexicographically.
16. Write a Java program to find whether a region in the current string matches a region in another string.

Sample Output:
str1[0 - 7] == str2[28 - 35]? true
str1[9 - 15] == str2[9 - 15]? false
17. Write a Java program to print all permutations of a given string with repetition.

Sample Output:
The given string is: PQR
The permuted strings are:
PPP, PPQ, PPR, RRP, RRQ, RRR
18. Write a Java method to count all words in a string.

Test Data:
Input the string: The quick brown fox jumps over the lazy dog.
Expected Output:
Number of words in the string: 9
19. Write a program in java to create Box class with parameterized constructor with an object argument to initialize length, breadth and height also create a function volume which returns the volume of the box and print it in main method.
20. Write a program in java with class Employee and do the following operations on it

a) Create two constructor default and with Object as parameter to initialize class variables.
b) Create a function Calculate which calculates the pf and allowances on the salary of employee and return the all values as an object.
21. Write a program to create your own exception as NegativeSizeException whenever negative values are put in an array.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

22. Create a class Student with following operations
a) create parameterized constructor to initialize the objects.
b) create a function isEqual() to check whether the two objects are equal or not which returns the Boolean value and gets two objects.
c) print the result in main method if objects are equals or not (take variables as your assumption)
23. Create an abstract class employee, having its properties and abstract function for calculating net salary and displaying the information. Derive manager and clerk class from this abstract class and implement the abstract method net salary and override the display method.

TOPIC/SUBTOPIC:

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	1. Write a program to display a message 2. Write a program to find the sum of two numbers 3. Write a program to test whether a number is positive or negative 4. Write a program to display numbers from 1 to 10 using while loop and do while loop 5. Write a program to use a foreach loop to retrieve elements one by one from an array 6. Write a program to return a value from a method
2	1. Write a program to accept a name, integer, float from the keyboard 2. Write a program to accept and display employee details 3. Write a program to accept the marks of a student into a 1D array from the keyboard to find total marks and percentage 4. Write a program which accepts elements of a matrix and display its transpose 5. Write a program to create strings and how to use the inbuilt methods associated with it 6. Write a program to compare two strings
3	1. Write a program to create a Person class and an object Ram to Person class and display the hashcode associated to it. 2. Write a program to initialize some instance variables in Demo

	class. 3. Write a program using a default constructor to initialize some instance variables. 4. Write a program to initialize some instance variables using parameterized constructor 5. Write a program for a method without parameters and without a return type 6. Write a program for a method without parameters and a return type 7. Write a program to test whether a static method can access the instance variables or not 8. Write a program to add two matrices and display the sum matrix
4	1. Write a program to create an object to a Student class and then store the date into it and retrieve it 2. Write a program to use extends keyword to create a new class by reusing an existing class code. 3. Write a program where the names of instance variables and methods in super and sub classes are same. 4. Write a program to access the super class method and instance variables by using super keyword from sub class 5. Write a program to see that the parameterized constructor of the super class can be called from sub class using super() 6. Write a program to find the area of Square, Rectangle by deriving them from Shape 7. Write a program to create a class which consists of two methods with same name but different signature.
5	1. Write a program where the abstract class has one abstract method which has got various implementations in sub class 2. Write a program in which abstract class Car contains an instance variable, one concrete method and two abstract methods. 3. Write a program in which a sub class implements the abstract methods of the super class

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

	4. Write a program to write abstract class with an instance variable, concrete method and an abstract method calculateBill(). Calculate Electricity bill. 5. Write a program to achieve multiple inheritance using multiple interface
6	1. Write a program to create a package and store addition class to it 2. Write a program to use the addition class. 3. Write a program that opens the file in the beginning. Then the number of command line arguments is taken into a variable. This variable divides 45 and the result is stored into another variable. Finally the files are closed. 4. Write a program to handle ArithmeticException and ArrayIndexOutOfBoundsException 5. Write a program that shows compile time error for IO Exception 6. Write a program that shows the use of throw clause for throwing NullPointerException 7. Write a program to throw user defined exception
7	1. Write a program to show the use of byte class objects 2. Write a program to create an applet with a background color and a message 3. Write a program to create a form where the user can type her details and select according to requirements 4. Write a program to move an airplane from left to right
8	1. Write a program to play audio in applets.

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 5

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-5-12-TH: Object Oriented Programming System (OOPs)

LECTURES ALLOTTED: 17P (1.5 hours each)

ALLOTTED SYLLABUS:

Concept of OOPs Difference with procedure oriented programming, Data abstraction and information hiding: Objects, Classes, methods.
Introduction to Java Java Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods).
Arrays, Strings and I/O Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files.
Object-Oriented Programming Overview Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 5

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-5-12-TH: Object Oriented Programming System (OOPs)

LECTURES ALLOTTED: 17P (1.5 hours each)

ALLOTTED SYLLABUS:

Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata. Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes, Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), Wrapper Classes, Autoboxing/Unboxing, Enumerations and Metadata.
Exception Handling, Threading, Networking and Database Connectivity Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 5

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-5-12-TH: Object Oriented Programming System (OOPs)

LECTURES ALLOTTED: 17P (1.5 hours each)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Difference with procedure oriented programming, Data abstraction
2	information hiding: Objects, Classes, methods.
3	Introduction to Java: Java Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output.
4	Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods).
5	Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically. Examples. Class and array (One Dimension and Multi-dimensional) examples.
6	Java Strings: The Java String class, Creating & Using String Objects. Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes.
7	Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files.
8	Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors and examples.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER 5

NAME OF FACULTY: ANTIKA SINHA

PAPER:CMS-A-CC-5-12-TH: Object Oriented Programming System (OOPs)

LECTURES ALLOTTED: 17P (1.5 hours each)

LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
9	Method Overloading, Class Variables & Methods, Objects as parameters, final classes. Garbage collection method in Java by JVM.
10	Inheritance: Introduction to Inheritance in JAVA. Single and Multilevel with examples. Packages; Standard Java Packages (util, lang, io, net).
11	Abstract Classes, Interfaces; method overriding; run time polymorphism.
12	Package and Class Visibility with examples. Discussion on Inheritance, interface and related problems day 1. autoboxing.
13	Exception Handling, types, throw, examples.
14	Uncaught exceptions, throw, built-in exceptions, Creating your own exceptions. Examples.
15	Multi-threading: The Thread class and Runnable interface with examples. creating single and multiple threads with examples.
16	Thread prioritization, synchronization and need with example.
17	Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER V

NAME OF FACULTY: SAGARIKA KAR CHOWDHURY

PAPER: CC12(TH)

LECTURES ALLOTTED:

ALLOTTED SYLLABUS:

Concept of OOPs
Difference with procedure oriented programming, Data abstraction and information hiding: Objects, Classes, methods.

Introduction to Java
Java Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional
statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods).

Arrays, Strings and I/O
Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files.

Object-Oriented Programming Overview
Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.

Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata.
Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes, Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), Wrapper Classes, Autoboxing/Unboxing, Enumerations and Metadata.

Exception Handling, Threading, Networking and Database Connectivity
Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram
programming. Accessing and manipulating databases using JDBC.

Applets
Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, textfields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Pillars of OOPS, Objects, Classes, Methods, Variables, Datatypes, Literals, Operators, Control Statements
2	Input and output, Arrays
3	Strings, Stringbuffer, Stringbuilder
4	Classes and Objects, Methods, Inheritance, Polymorphism
5	Typecasting, Abstract classes, Interface, Packages
6	Exception Handling, Wrapper class, Applets
7	Threads, Swings, JDBC

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-V

NAME OF FACULTY: Prof. Sk Mohiuddin

PAPER: CMSA-DSE-A-1 (P)

LECTURES ALLOTTED: 16 (3 hrs. each)

ALLOTTED SYLLABUS:

Assignments

1. Write a program to convert image format, i.e., from RGB to gray, gray to binary, RGB to binary, RGB to HSV, HSV to RGB, RGB to YCbCr, and YCbCr to RGB.
2. Write a program to separate color into R, G, and B from an image.
3. Write a program to perform the following image arithmetic: a) Image addition, b) Image subtraction, c) Image multiplication, and d) Image division
4. Write a program to average two images together into a single image. Display the new image.
5. Write a program to compare two images using image subtraction.
6. Write a program to enhance the image in the spatial domain using – a) Image negative b) Log transformation c) Power law transform and d) Piecewise linear transform
7. Write a program to find the histogram of a gray image and display the histogram.
8. Write a program to enhance the image in the spatial domain using the histogram equalization method.
9. Write a program to add various types of noise (salt and pepper noise, Gaussian noise) to an image.
10. Write a program to enhance an image using mean filtering, weighted average filtering, median filtering, and max/min filtering.
11. Write a program to perform the following image enhancement methods: a) Brightness enhancement, b) Brightness suppression, c) Contrast manipulation, d) Gray level slicing without background
12. Write a program to find the edge of a given image with the following operators: a) Difference operator, b) Robert operator, c) Prewitt operator, d) Sobel operator
13. Write a program to segment an image using the thresholding technique.
14. Write a program to segment an image based on a) Region growing, b) Region splitting, and c) Region merging
15. Write a program to read an image, rotate it in a clockwise and anti-clockwise direction, and display it.
16. Write a program to read two images 'lena.bin' and peppers.bin'. define a new 256 x 256 image J as follows : the left half of J i.e., the first 128 columns, should be equal to the left half of lena image, and the right half of J, i.e., the 129th column through the 256th column should be equal to the right half of pepper image. Show J image.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to Python in Image Processing programming, and guiding the installation of the required software and dependencies.
2	Learning basic codes in Python to be used in Image Processing and the use of different packages like OpenCV, PIL, and matplotlib.
3	Assignment 1
4	Assignment 1 (continuation) and Assignment 2.
5	Assignment 3
6	Assignment 4 and Assignment 5
7	Assignment 6
8	Assignment 7 and Assignment 8
9	Practicing applications of Assignments 1-8
10	Assignment 9 and Assignment 10
11	Assignment 10 (Continuation) and Assignment 11
12	Assignment 12
13	Assignment 13
14	Assignment 14
15	Assignment 15 and Assignment 16
16	Practicing applications of Assignments 9-16

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-V

NAME OF FACULTY: Dr. Samir Malakar

PAPER: CMSA-DSE-A-1 (P)

LECTURES ALLOTTED: 16 (3 hrs. each)

ALLOTTED SYLLABUS:

Assignments

1. Write a program to convert image format, i.e., from RGB to gray, gray to binary, RGB to binary, RGB to HSV, HSV to RGB, RGB to YCbCr, and YCbCr to RGB.
2. Write a program to separate color into R, G, and B from an image.
3. Write a program to perform the following image arithmetic: a) Image addition, b) Image subtraction, c) Image multiplication, and d) Image division
4. Write a program to average two images together into a single image. Display the new image.
5. Write a program to compare two images using image subtraction.
6. Write a program to enhance the image in the spatial domain using – a) Image negative b) Log transformation c) Power law transform and d) Piecewise linear transform
7. Write a program to find the histogram of a gray image and display the histogram.
8. Write a program to enhance the image in the spatial domain using the histogram equalization method.
9. Write a program to add various types of noise (salt and pepper noise, Gaussian noise) to an image.
10. Write a program to enhance an image using mean filtering, weighted average filtering, median filtering, and max/min filtering.
11. Write a program to perform the following image enhancement methods: a) Brightness enhancement, b) Brightness suppression, c) Contrast manipulation, d) Gray level slicing without background
12. Write a program to find the edge of a given image with the following operators: a) Difference operator, b) Robert operator, c) Prewitt operator, d) Sobel operator
13. Write a program to segment an image using the thresholding technique.
14. Write a program to segment an image based on a) Region growing, b) Region splitting, and c) Region merging
15. Write a program to read an image, rotate it in a clockwise and anti-clockwise direction, and display it.
16. Write a program to read two images 'lena.bin' and peppers.bin'. define a new 256 x 256 image J as follows : the left half of J i.e., the first 128 columns, should be equal to the left half of lena image, and the right half of J, i.e., the 129th column through the 256th column should be equal to the right half of pepper image. Show J image.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to Python in Image Processing programming, and guiding the installation of the required software and dependencies.
2	Learning basic codes in Python to be used in Image Processing and the use of different packages like OpenCV, PIL, and matplotlib.
3	Assignment 1
4	Assignment 1 (continuation) and Assignment 2.
5	Assignment 3
6	Assignment 4 and Assignment 5
7	Assignment 6
8	Assignment 7 and Assignment 8
9	Practicing applications of Assignments 1-8
10	Assignment 9 and Assignment 10
11	Assignment 10 (Continuation) and Assignment 11
12	Assignment 12
13	Assignment 13
14	Assignment 14
15	Assignment 15 and Assignment 16
16	Practicing applications of Assignments 9-16

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-V

NAME OF FACULTY: Sk Mohiuddin

PAPER: DSE-A (TH)

LECTURES ALLOTTED: 15 (1.5 Hours per Lecture)

ALLOTTED SYLLABUS:

Introduction
Image definition and its representation, Pixels, Co-ordinate conventions, Image formats (Study of the image matrix), neighborhood metrics, Sampling and quantization, Types of distance measure (concept only).

Image Segmentation
Boundary detection-based techniques, Point, line detection, Edge detection, Local processing.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Image definition and its representation, Pixels, Co-ordinate conventions.
2	Image formats (Study of the image matrix) like RGB, YC_bC_r, Gray scale matrix
3	Sampling and quantization.
4	Digital Image Fundamentals-Neighbourhood, Connectivity, boundaries, Relations, Distance Measures.
5	Problem solving of previous lectures.
6	Point Detection, Line Detection.
7	Edge detection- first order and second order gradients
8	Problem solving of previous lectures.
9	Assignment Checking and Discussion.
10	University questions Discussion to date.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

11	Thresholding – Global and/or optimal thresholding techniques; Region-based segmentation
12	Problem solving of previous lectures.
13	Discussion on Home task for self-learning and new Problem solving
14	University questions Discussion.
15	Doubt clearing class.

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-V

NAME OF FACULTY: Dr. Samir Malakar

PAPER: CMSA-DSE-A-1 (TH)

LECTURES ALLOTTED: 16 (1.5 hrs. each)

ALLOTTED SYLLABUS:

Spatial Domain
Image enhancement techniques in spatial domain, Contrast stretching, Histogram Processing, Noise smoothing, Sharpening, Pixel Classification, RGB & Grey image. Transformation: Arithmetic Transformation, Logical Geometric Transformation, Hough Transformation, FFT.
Filtering: Spatial domain filters: Convolution, Edge Detection Filters

Thresholding
Grey level thresholding, global/ local thresholding, Iterative thresholding, Edge detection operators, Region growing, Split/ merge techniques, Image feature/primitive extraction, Background correction, Color enhancement.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to Image enhancement techniques in the spatial domain
2	Contrast stretching, Histogram Processing
3	Continuation of Histogram Processing.
4	Noise smoothing and Sharpening
5	Pixel Classification, RGB & Grey image
6	Transformation: Arithmetic Transformation, Logical Geometric Transformation
7	Question Answer Discussion till lecture 6.
8	Hough Transformation
9	FFT

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

10	Spatial domain filters: Convolution, Edge Detection Filters
11	Grey level thresholding, global/ local thresholding, Iterative thresholding
12	Edge detection operators
13	Region growing, Split/ merge techniques
14	Image feature/primitive extraction, Background correction, Color enhancement.
15	Question Answer Discussion till lecture (8-14).
16	University questions Discussion

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER V

NAME OF FACULTY: SAGARIKA KAR CHOWDHURY

PAPER: DSE B2 (P)

LECTURES ALLOTTED: 10(3 hrs each)

ALLOTTED SYLLABUS:

The Interpreter as a calculator. Basic arithmetic operations. Introduction to the simple numeric data types – integers, floating point numbers, Boolean, complex numbers. Inter conversion of data types.
a. Use the Python prompt as a basic calculator. Explore the order of operations using parentheses.
b. Explore the various functions in the math module. Eg: find GCD of two numbers, area and perimeter of circle using math.pi, etc.
c. Exploring the complex data type and their operations, eg: finding the modulus and phase angle of a complex number.
d. The print function – Printing values. Repeat the previous experiments now using the print function
2. Basic user interactions using the print() and input() functions.
a. Write a simple python script using the print function in a text editor, save it with the extension ".py". Run it in the terminal / command prompt.
b. Take input two strings from the user, and print the first one twice, and the other one thrice.
c. Ask the user to enter two numbers, and output the sum, product, difference, and the GCD.
d. More programs that test concepts learned in week 1 which involves the usage of the print and input functions.
3. Strings, List, Tuples, the re (regular expression) module
a. Ask the user for two strings, print a new string where the first string is reversed, and the second string is converted to upper case. Sample strings: "Pets", "party", output: "steP PARTY". Only use string slicing and + operators.
b. From a list of words, join all the words in the odd and even indices to form two strings. Use list slicing and join methods.
c. Simulate a stack and a queue using lists. Note that the queue deletion operation won't run in O(1) time.
d. Explore the 're' module, especially re.split, re.join, re.search and re.match methods.
4. Conditionals, looping constructs, and generators
a. Use list comprehension to find all the odd numbers and numbers divisible by 3 from a list of numbers.
b. Using while loops to do Gaussian addition on a list having an even number of numbers. Print each partial sum. Eg: if the list is [1, 2, 3, 4, 5, 6], the program should output "1 + 6", "2 + 5", and "3+4" in separate lines, and the result of
the addition "21". Extend it to handle lists of odd length.
c. Primarily testing using for and while loops.
d. Use (c) to generate a list of primes within a user-given range.
e. Explore the 'key' function of sum( ), min( ), max( ), and sort( ) functions using lambdas.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

5. User defined functions
a. Implement popular sorting algorithms like quick sort and merge sort to sort lists of numbers.
b. Implement the Pascal's triangle.
c. Three positive integers a, b, and c are Pythagorean triples if a2+ b2 =c2. Write a function to generate all Pythagorean triples in a certain range.
d. Write two functions that simulate the toss of a fair coin, and the roll of an unbiased 'n' sided die using the random module.
e. Like (d), but now the coin and the die are not fair, with each outcome having a given probability.
6. File handling, sys, pickle and csv modules
a. Basic file operations. Explore the different file modes.
b. Emulate the unix 'cp', 'grep', 'cat' programs in Python. In each case, the user should pass the arguments to the program as command line arguments.
c. Use pickle for persistent storage of variables
7. Sets and dictionaries
a. Use sets to de-duplicate a list of numbers, and a string such that they contain only the unique elements
b. Use the set union and intersection operations to implement the Jaccard and Cosine similarity of two sets.
c. Use dictionaries to count the word and letter occurrences in a long string of text.
d. Invert a dictionary such the previous keys become values and values keys. Eg: if the initial and inverted dictionaries are d1 and d2, where d1 = {1: 'a', 2: 'b', 3: 120}, then d2 = {'a': 1, 2: 'b', 120: 3}.
e. What if the values in (d) are not immutable? Use frozensets. For repeated values, use lists. Eg: if d1 = {1: 'a', 2: 'a', 4: [1, 2]}, then d2 = {'a': [1, 2], frozenset([1, 2]): 4}.
f. Write a function to generate the Fibonacci numbers in (a) exponential time using the naïve algorithm, and (b) in linear time using dynamic programming (memorization) with a dictionary.
8. Object Oriented Programming
a. Create a 'Graph' class to store and manipulate graphs. It should have the following functions:
i. Read an edge list file, where each edge (u, v) appears exactly once in the file as space separated values.
ii. Add and remove nodes and edges
iii. Print nodes, and edges in a user readable format
iv. Computes basic statistics of the graph like degree distribution, clustering coefficient, and the number of connected components.
v. Finding all the neighbors of a node
vi. Finding all the connected components and storing them as individual Graph objects inside the class
vii. Finding single source shortest paths using Breadth First Search
b. Make a 'DiGraph' class to handle directed graphs which inherits from the 'Graph' class. In addition to all of the functionalities of (a), it should support the following operations
i. Finding the predecessors and successors of a node
ii. Creating a new 'DiGraph' object where all the edges are reversed.
iii. Finding the strongly connected components
c. Extend (a) and (b) to handle weighted graphs, and implement Dijkstra's and Floyd-Warshall algorithms to compute the single source and all pairs shortest paths.
d. Use the graph containers in (a), (b), and (c) to implement additional graph algorithms.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	1. Write a program to create a byte type array read and display the elements of the array. 2. Write a programs to accept two numbers and find the sum and product 3. Write a program to accept a float number from the keyboard 4. Write a program to display numbers from 1 to 10 using do while loop 5. Write a program to determine whether a person is eligible to vote or not and display how many years left to vote
2	1. Write a program to determine the character entered by the user. 2. Write a program to find whether a number is odd or not 3. Write a program to find whether a year is leap year or not 4. Write a program to find whether a character is vowel or not. 5. Write a program to find the greatest of 3 numbers 6. Write a program to calculate roots of a quadratic equation
3	1. Write a program to calculate GCD of two numbers 2. Write a program to display the elements of a list using a for loop 3. Write a program to find the sum of first 10 natural numbers 4. Write a program to classify whether a number is prime or not 5. Write a program to sum the series 1+1/2+....1/n
4	1. Write a program to use zip() function 2. Write a program to print elements in a tuple 3. Write a program to append a string 4. Write a program to use split() function to split a multiline string 5. Write a program to do slice operation.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

5	1. Write a program that finds whether a given character is a string or not. If it is present then print its index at which it is present. Do not use built in function 2. Write a program to count the occurrences of a character in a string 3. Write a program that accepts a string from the user and display the same string after removing the vowels, digits, capital letters. 4. Write a program to take a number and then start a countdown from that number to zero
6	1. Write a program to create a lambda that return a squared value of a given number 2. Write a lambda function to find the bigger no.s of two given number 3. Write a program using filter function to extract odd numbers from a list 4. Write a program to find the square of elements in a list using map function
7	1. Write a program to store employee details using getter setter methods 2. Write a program that has a class point . Define another class Location which has 2 objects location and destination of class point. Also define a function in location that prints the reflection of destination in the x axis 3. Write a program that has classes such as student , course, dept. Enroll a student in a course of a particular dept.
8	1. Write a program that asks the user to enter the number and print its square if no number is entered then a keyboard interrupt is generated 2. Write a program that asks the user if the number is positive or 0 and print it else raise an exception 3. Write a program that copies the first 10 bytes of a binary file into another 4. Write a program to split the line into a series of words and use space to perform the split operation 5. Write a program that copies one python script in such a way that

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

	all comment lines are skipped and not copied in the destination file
9	1. Write a program to add two complex numbers without overloading + operator 2. Write a program to compare two objects of user defined class type 3. Write a program to compare two Date objects
10	1. Write a program to use hash() method.

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER

NAME OF FACULTY: SAGARIKA KAR CHOWDHURY

PAPER: DSE B2(TH)

LECTURES ALLOTTED:

ALLOTTED SYLLABUS:

Interpreted vs. compiled languages. Bytecodes. The importance of whitespace.Variables and the lack of explicit data types and how Python uses the concepts of duck,strong, and static typing, to figure out data types in runtime.
The assignment operator, the binding of names to objects, and aliasing. Keywords and their significance
Strings: definition, declaration, and immutability, string constants, declaration, and the equivalence of single and double quotes. Multi-line strings. Raw strings. String formatting using the format function and the % operator. f-strings in Python 3.6+. Built-in functions: count, find, replace, upper, lower, strip, etc. Time and space complexities of the functions and operations.
Lists: definition, declaration, and mutability. Nested lists. Indexing and slicing: same as strings. List comprehensions. The split and join methods. Built-in list functions – append, extend, count, find, index, etc. Time and space complexities of the functions andoperations.
Tuples: definition, declaration, and immutability. Packing and unpacking lists and tuples. The + and * operators on strings, lists, and tuples. Indexing and slicing strings, lists, and tuples.
Conditionals, Iterators, and Generators
Conditionals: If, elif, and else statements. Nested conditionals. Containment checking in containers using the in keyword.
Looping constructs: while and for loops. Flow control using break, continue, and pass.Nested loops.
Generators: range, zip, sorted, reversed, and enumerate
User-defined Functions and Recursion
Functions: definition, function signature, positional, default, and keyword arguments. Documentation strings. Unnamed functions – lambda, filter, and map. Recursion: basic idea, implementing recursion, sharing variables across the recursion stack, modifying the size of the recursion stack.
File Handling and Exception Handling
File handling: open and close methods, the different read and write modes. Using the withopen approach to files. read, readline, readlines functions. The csv module for efficient read/write of structured data. The pickle module for persistent storage of variables in a program. Exception handling: the popular errors- Name Error, Value Error, Syntax Error, Key Error, Attribute Error, etc, and their cause and effects. Using try-except blocks for graceful handling of exceptions.
Unordered data types - Sets and Dictionaries
Basic concepts of hashing: hash functions, open chain, closed chain, advantages and disadvantages compared to conventional ordered data types. The hash() function in Python. **Sets and frozensets:** definition, declaration, mutability, and advantages over lists / tuples.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

Insertion, deletion, union, intersection, and other built-in operations. Time and space complexities of the functions and operations.

Dictionaries: Concept of keys and values. Immutability requirement for keys. Basic operations on dictionaries. Iterating over the keys and key, value pairs of a dictionary. Dictionary inversions

Intro to Object Oriented Programming

The Python data model, magic methods (__init__, __str__, __eq__, etc) and their utilities, accessing and mutating data, constructors, class methods, and the lack of explicit access modifiers of class methods – naming conventions of private, protected, and public variables and methods. Inheritance: inheriting a parent class, the super() method. Basic multiple inheritance.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Interpreted vs compiled language, bytecodes, PVM, Datatypes, Comments, Docstrings, Sequences, Tuple, Range, Sets, Dictionaries, Constants, Operators
2	Literals, Generators, Input statements, control statements
3	Strings, functions, Recursion, classes and Objects, Lambda
4	Inheritance, Abstract classes, Interface, Operator Overloading
5	Exception Handling, File Handling, Hashing

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER I

NAME OF FACULTY: SHILPA SAHA

PAPER: CC1_GE1(P)

LECTURES ALLOTTED: 10(1.5 hrs. each)

ALLOTTED SYLLABUS:

Word Processing:
Document creation, saving, editing; Formatting text and paragraphs**;** header and footers**;** clipart, tables; tools, Inserting images, files; mail merge; margins; Hyphenation; page setups; OLE; index and references; comments; templates; macros.

Spreadsheet:
Workbook, worksheets, cell; address; entering, editing, formatting, filtering, sorting worksheet data; printing; charts; functions and formula; macros; importing, exporting files.

Presentation:
Slides; formatting; wizard, layout; word art; animation.

Web Design:
Web page design can be taught in the laboratory classes by using HTML.
Basic Tags and Document structure, HTML Tags, Head Tags, Title Tags, Introduction to HTML and Web design, How to create simple Web page, How to format text, Create Table, Adding Web link and Images, Forms, Adding styles and classes to web pages, Borders and Background, Adding Video and Graphics.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	HTML INTRODUCTION
2	BASIC TAGS,DOCUMENT STRUCTURE
3	TAGS OF LIST IN HTML
4	MAIL MERGE IN MS WORD
5	TABLE IN MS WORD
6	CREATE TABLE IN HTML

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

7	MS EXCEL
8	MS POWERPOINT
9	FORM CREATION IN HTML AND HYPERLINK
10	DESIGN WEB PAGE

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OFCOMPUTER SCIENCE

TEACHING PLANFOR SEMESTER I

NAME OF FACULTY: SHILPA SAHA

PAPER: CC1_GE1(T)

LECTURES ALLOTTED: 8(45 mnts. each)

ALLOTTEDSYLLABUS:

Group A: Computer Fundamentals (20 hours)
General Concepts:
Introduction to Computer and Problem Solving: Information and Data
Hardware: CPU, Primary and Secondary storage, Cache Memory, I/O devices, Bus structure, BIOS
Software: Systems and Application.
Generation of Computers: Super, Mainframe, Mini and Personal Computer, Work stations, Parallel machines (concept only).
Introduction to Programming Languages: Machine Language, Assembly Language, High Level Language.
Problem Solving: Flow Charts, Decision Tables and Pseudo codes.
System Software: Classifications- Operating Systems (OS); Translators – Compilers and Interpreters, Preprocessors, Assemblers, Loaders, Linkers, Line and Screen Editors, other utilities.
Virus: Concept, Detection and Protection

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	INTRODUCTION TO COMPUTER(DEFINITION,FUNCTION,ADVANTAGE,DISADVANTAGE)
2	CPU, PRIMARY AND SECONDARY STORAGE,I/O DEVICES
3	COMPUTER LANGUAGES,COMPUTER GENERATION
4	SUPER, MAINFRAME, MINI AND PERSONAL COMPUTER, WORK STATIONS, PARALLEL MACHINES (CONCEPT ONLY).

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

5	OPERATING SYSTEM,COMPILERS,INTERPRETER,PREPROCESSOR,ASSEMBLER
6	VIRUS CONCEPT
7	FLOW CHART,DECISION TABLE
8	BUS STRUCTURE,BIOS

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER -I

NAME OF FACULTY: TONMOY METE

PAPER: CMS-G-CC-1-1-P

LECTURES ALLOTTED: 12 (1.5 Hrs. per Lab)

ALLOTTED SYLLABUS:

Web Design: Web page design can be taught in the laboratory classes by using HTML. Basic Tags and Document structure, HTML Tags, Head Tags, Title Tags, Introduction to HTML and Web design, How to create simple Web page, How to format text, Create Table, Adding Web link and Images, Forms, Adding styles and classes to web pages, Borders and Background, Adding Video and Graphics.

Lec. No.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Assignment 1: Basic Tags and Document structure
2	Assignment 2: HTML Tags
3	Assignment 3: Head Tags, Title Tags, Introduction to HTML and Web design
4	Continuation of Assignment 3
5	Assignment 4: How to create simple Web page
6	Continuation of Assignment 4
7	Assignment 5: How to format text, Create Table, Adding Web link and Images
8	Continuation of Assignment 5
9	Assignment 6: Forms, Adding styles and classes to web pages
10	Continuation of Assignment 6
11	Assignment 7: Borders and Background, Adding Video and Graphics
12	Continuation of Assignment 7

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER

NAME OF FACULTY: SAGARIKA KAR CHOWDHURY

PAPER: Cc1/GE1 (TH)

LECTURES ALLOTTED:

ALLOTTED SYLLABUS:

Number Systems and Codes:
Number representation: Weighted Codes, Non-weighted codes, Positional, Binary, Octal, Hexadecimal, Binary Coded Decimal (BCD), Conversion of bases. Complement notions: 1's complement, 2's complement, Binary Arithmetic, Binary Codes: Gray, Alphanumeric, ASCII, EBCDIC; Single Error-Detecting and Correcting Codes, Hamming Codes, Fixed point, Floating point representation.

Boolean Algebra:
Fundamentals of Boolean Algebra, Switches and Inverters, Functionally Complete Gates (AND, OR, NOT), NAND, NOR, Boolean Function. De Morgan's Theorem, Min-term, Max term, Truth tables and minimization of Logic expression up to four variables, Boolean Algebraic and K-map methods of Logic circuit synthesis, two-level and multi-level.

Digital Electronics: (24 hours)
Combinational Circuits: Realization of AND and OR Gates using diodes and NOT Gate using transistors, Half adder and Full Adder (3 & 4 bit), Multi-bit adders – Ripple carry and Carry Look Ahead Adder, Adder/subtractor, BCD-Adder, Data selectors/multiplexers – expansions, reductions, function realization, universal function realization, multi-function realization, Decoders: function realization, De-multiplexer and function realization, Encoder, Priority
Encoder, Parity bit Generator/checker, Gray Code Generator, Code Converters, Keyboard encoder, Seven segment display unit, Comparators. Sequential Circuits: Model of Sequential computing, Difference between Combinational and Sequential circuit, RS-Latch: using NAND and NOR Gates, Digital Clock – Duty Cycle, Rising time, Falling time, Clocked Flip Flops - SR, JK, D, T, Level Trigger and Edge Trigger, Excitation Functions of each flip-flops, Flip-flops with Preset and Clear, Application of Flipflops: Asynchronous Counter (UP/DOWN) up to 4 bit counter, Decade Counter, Mod – n Counter, Finite State machine Model – State Transition Diagram and Table, Synchronous
Counters – different mod-n counters, Ring counter, Registers: Registers with parallel load, Shift Registers.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Number System, Binary, Decimal, Octal, hexadecimal, conversion of bases, Examples regarding all the conversions
2	1's complement, 2's complement, addition, subtraction, Examples regarding all the operations, subtraction using 2s complement
3	BCD, hamming codes, Boolean Algebra, Examples of Boolean algebra
4	Logic Gates (AND, OR, NOT, NAND, NOR), Boolean Function, Don't Care conditions
5	Combinational Logic, Adders, Subtractors, Half adder, full adder, ripple carry and carry look ahead adder, BCD adder
6	Multiplexers, Flipflops,
7	Counters , Registers

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER-III

NAME OF FACULTY: Sk Mohiuddin

PAPER: CMSG CC-3 (TH)

LECTURES ALLOTTED: 40 (45 mins per Lecture)

ALLOTTED SYLLABUS:

Basic Computer Organization:
IAS Computer, Von Neumann Computer, System Bus. Instruction Cycle, Data Representation, Machine cycle, CPU Organization: Arithmetic and Logic Unit, Control Unit, CPU Registers, Instruction Registers, Program Counter, Stack Pointer, CISC & RISC processors.

Instruction:
Operation Code and Operand, One, Two and Three address instruction. Instruction types.

Control Unit:
Control Structure, Hardwired Control and Micro programmed Control: Basic Concept, Parallelism in Micro-instruction.

ALU:
Basic Structure of ALU, Addressing mode, Instruction Formats, Handling of interrupts and subroutines, Combinational ALU, 2's Complement Addition, Subtraction Unit, Booth's Algorithm for multiplication and division.

Memory:
Types of Memory: Primary and Secondary; RAM, ROM, EPROM, EEPROM, DRAM, SRAM, PLA. Different storage technology; Memory Hierarchy: CPU Register, Cache Memory, and Virtual Memory.

I/O:
Polling, Interrupts, DMA, I/O Bus and Protocol, Memory mapped I/O and I/O mapped I/O, I/O system organization and interfacing, Bus: SCSI, PCI, USB, Bus arbitration.

Computer Peripherals:
VDU, Keyboard, Mouse, Printer, Scanner etc.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	IAS Computer, Von Neumann Computer
2	System Bus. Instruction Cycle, Data Representation.
3	Machine cycle, CPU Organization: Arithmetic and Logic Unit, Control Unit
4	Continuing the previous topic
5	CPU Registers, Instruction Registers, Program Counter, Stack Pointer
6	CISC & RISC processors.
7	Problem solving of previous lectures.
8	Operation Code and Operand, One, Two and Three address instruction. Instruction types.
9	Problem solving of previous lectures.
10	Control Structure, Hardwired Control and Micro programmed Control: Basic Concept
11	Continuing the previous topic
12	Continuing the previous topic
13	Parallelism in Micro-instruction.
14	Basic Structure of ALU
15	Addressing mode, Instruction Formats.
16	Handling of interrupts and subroutines
17	Combinational ALU, 2's Complement Addition, Subtraction Unit.
18	Continuing the previous topic
19	Booth's Algorithm for multiplication and division.
20	Booth's Algorithm for division
21	Problem solving of previous lectures.
22	Types of Memory: Primary and Secondary; RAM, ROM.
23	EPROM, EEPROM, DRAM, SRAM, PLA.

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

24	Continuing the previous topic
25	Continuing the previous topic
26	Different storage technology; Memory Hierarchy: CPU Register, Cache Memory, and Virtual Memory.
27	Continuing the previous topic
28	Polling, Interrupts
29	DMA, I/O Bus and Protocol.
30	Memory mapped I/O and I/O mapped I/O.
31	I/O system organization and interfacing.
32	Continuing the previous topic
33	Bus: SCSI, PCI, USB, Bus arbitration.
34	Continuing the previous topic
35	VDU, Keyboard, Mouse, Printer, Scanner etc.
36	Continuing the previous topic
37	University questions Discussion.
38	University questions Discussion.
39	Doubt clearing class.
40	Doubt clearing class.

SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF COMPUTER SCIENCE

TEACHING PLAN FOR SEMESTER V

NAME OF FACULTY: SAGARIKA KAR CHOWDHURY

PAPER: DSE A (TH) (General)

LECTURES ALLOTTED:

ALLOTTED SYLLABUS:

Introduction:
Drawbacks of Legacy System; Advantages of DBMS; Layered Architecture of Database, Data Independence; Data Models; Schemas and Instances; Database Languages.

ER Model:
Entity, Attributes and Relationship; Structural Constraints; Keys; ER Diagram of Some Example Database; Weak and Strong Entity Set; Symbolic Conventions; Specialization and Generalization; Constraints of Specialization and Generalization; Aggregation.

Relational Model:
Basic Concepts of Relational Model; Relational Algebra; Tuple Relational Calculus

Relational Database Design: (22 hours)
Problems of Un-Normalized Database; Functional Dependencies (FD), Derivation Rules, Closure of FD Set, Membership of a Dependency, Canonical Cover; Decomposition to 1NF, 2NF, 3NF and BCNF using FD; Lossless Join Decomposition Algorithm; Dependency preservation.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Data, Information, File Management System, Database Management System, Components of database
2	Data models, Types of Database architecture, schemas, instances, Conceptual Data modeling
3	Entity, attributes, types of entities, types of attributes
4	Keys , relationships, relationship sets, ER Diagram, Roles, Mapping cardinality
5	Participation constraints, Specialization, Generalization, Aggregation
6	Relational Model, Referential Integrity, Constraint, Domain Constraint,

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

	Key constraint
7	Relational Operators(select, project, union, intersection, set difference, cross product) Relational Algebra queries, Join Operations
8	Functional Dependency, Normalization
9	Lossy and Lossless Decomposition.

SIGNATURE