

ARYANS GROUP OF COLLEGES

**WORK PLAN
2016-2017
CSE II**

“Aryans Group strive for research, development & innovation in all relevant fields, thereby providing the students requisite platform to showcase their talents & prepare them with an integrated & technology oriented education for a better career and to be worthy citizens of a global society”

CONTENTS

S.NO	TOPICS	PAGES
1	Parameters and Modalities of Assessment	3
2	Rules & Regulations <ul style="list-style-type: none"> • Code of conduct • Hostel Rules • Library Rules • Dress code 	4-9
3	Aryans towards Environmental Awareness	10
4	List of Holidays	10
5	Events Chart	11
6	Marking Scheme for MST's & Final Examination	12
7	SEMESTER – III	13
8	Academic Calendar (August-December)	14-15
9	Course syllabus Structure	16
10	Syllabus	17-27
11	Date sheet for MST I & MST II	28
12	THIRD Semester Examination	29
13	SEMESTER – IV	30
14	Academic Calendar (January-April)	31
15	Course Syllabus Structure	33
16	Syllabus	34-41
17	Date sheet for MST I & MST II	42
18	FOURTH Semester Examination	43

PARAMETERS AND MODALITIES OF ASSESSMENT

- This syllabus is subject to any modification if required by the university.
- In case a holiday is declared on a day scheduled for a test, it will be rescheduled.
- First Mid Semester Examination scheduled to be held in September will be based on syllabus covered before first Mid Semester Examination.
- Second Mid-Semester Examination scheduled to be held in November, will be based on syllabus covered after first Mid Semester Examination.
- The Question Papers of all the subjects will be based on PTU Pattern.
- Student has to submit his/her assignments as per the prescribed dates given by the Subject Teacher.
- 40 Marks are assigned to a Student's performance in MSTs, Assignments, Overall Attendance, Class Tests, Class Behavior & Class Presentation.
 - MST Marks 12 Marks
 - Class Assignments 8 Marks
 - Class Presentation 8 Marks
 - Attendance 4 Marks
 - Class Test 4 Marks
 - Class Behavior 4 Marks
- Students must clear their dues in Accounts Office before taking their Admit Cards.
- Results of those students who are in arrears of fees shall be withheld.
- No request for any re-test, re-examination, re-consideration of awards, shall be entertained.

RULES & REGULATIONS

Code of Conduct

- All the students must ensure that the campus of the Institute and its facilities are maintained in a neat and clean way.
- All the students must strictly abide by the instructions, issued from time to time and conveyed through the notice Board of the Institute.
- Students must be seated in the classroom five minutes before the schedule time. No student will be allowed to leave the class, once the teacher is in the classroom.
- The academic regulations of the university require a student to attend 75% of lectures to be eligible to take the examination. However, it is desirable that all students attend all the classes regularly. Students attending classes over and above 75% will be suitably rewarded.
- All students must see the notice board and the class bulletin boards regularly to keep themselves updated about their academic schedules and requirements, no separate information will be provided.
- Students are not allowed to loiter unnecessarily in the Institute/Computer Lab/Library and Hostel Campus during class hours, if anybody is found guilty fine can be imposed on them.
- All students must maintain strict behavioral decency and discipline at all times. Any such act, which is unbecoming of a student, may lead to his withdrawal from the programme.
- Students should maintain discipline in the Computer lab/ Library/ Class room sessions. They should also take care of the equipments. Mishandling/ damage of the equipment may lead to fine.
- All students must follow the dress code on the fixed days of the week. For other working days they should come formally dressed to the college. Wearing fashionable casual dress is not allowed during the academic session (Kurta, Pajama, Sleepers, Round neck T-shirt).

- The Official dress code of ACE should be observed during placement interviews/Guest lecturers/Institutional events/ Industrial visits.
- Students should carry their identity cards to the Institute everyday and to be produced on demand. Entry without ID card is prohibited in the campus.
- Cigarettes, alcohol and narcotic drugs are strictly prohibited in and around the ACE premises.
- The use of cellular phones is strictly prohibited. The carrying of mobile phone will lead to the confiscation of the same for three years.
- Any dues against the student due to loss/damage of ACE property shall be recovered/adjusted from security deposit.
- Students are not allowed to bring any unauthorized person into the Institute or Hostel Campus without prior permission and approval from the Director.
- No firearms, weapons or potentially dangerous instruments shall be stored in the campus in general or carried in person.
- Smoking and consumption of any alcoholic beverage or intoxicant is strictly prohibited within the campus of the Institute.
- Student's presence is must in any activity or event organized by College.
- Suspension / Expulsion orders can be implemented with regards to any student at any point of time on the following grounds:
 - Willful violation of Institute's rules & regulations.
 - Misuse of Computer facilities / Cyber crime: Any students found downloading obscene material shall be liable to strict punishment.
 - Non-attendance of classes / tutorials as per institute norms.
 - Non-payment of institute dues.
 - Abusive behavior towards peers, juniors or faculty / staff in the college, sending objectionable emails to faculty and staff.

- Any of the conduct/ rules of the Institute can / will be changed at appropriate time by Academic Council.
- No student is allowed to move out of the campus before 4pm.

Transport Rules

- The transport fee should be paid in the beginning of each semester/year.
- The student should obtain a bus pass. Without bus pass you are not allowed to travel in College bus.
- The Students travelling in the college bus should not create any disturbance to other fellow students and staff and should maintain proper discipline.
- The student will not be permitted to board or drop at points other than that is specified in their bus pass.
- All types of charges and fee relating to the transport facility are subject to revision by the college authorities for time to time.
- The bus facility is available as per the college rule.
- All the Students travelling in the college bus should carry the bus pass and produce the same at any time if demanded by the authority.
- The student must report at the stoppage before at least 5 minutes as per the scheduled time .In case he/she is late, college will not be responsible for his/her absence in the college.
- While travelling in the college bus, movement on foot-board is strictly prohibited.
- All the students/parents are expected to be aware of the transport rules of the college and ignorance of the same will not to be excuse for any dispute /claim.
- The student has to make his/her own arrangement for reporting to any interview or any kind of examination which are held outside the campus. However he/she may avail the facility, if provide by the college.
- The bus facility shall be provided in the morning and in the evening not in between during the working hours.

Hostel Rules

- A hostelite will have to stay in the room allotted to him or her with two or more roommates.
- Inmates of each room are jointly held responsible for the furniture and other things. Any damage to the hostel property is recoverable from them.
- Guests are strictly prohibited from entering hostel premises without prior admission of the warden.
- Once a student has paid and has been allotted hostel accommodation, under no circumstances the money will be refunded.
- Students may be expelled from the hostel for violation of rules and regulations, such as theft, ragging, abnormal behavior, use of drugs, alcohol, and indiscipline. A student expelled on disciplinary grounds shall forfeit his/her fees and deposit.
- Management reserves the right to reject any applicant's admission to the hostel.

Library Rules

- Library membership is compulsory for all the students. Library Timing from 9.00am To 4.30pm. Days Monday to Sunday.
- Library membership will be valid for one academic year. Students will have to get their membership renewed at the beginning of each new academic year.
- Smart Card shall be issued to each student for borrowing books from the library. Student can borrow a maximum of two text books on that smart Card.
- Reader tickets are non-transferable. The student himself/herself will be responsible for any misuse of his/her ticket. Exchanging tickets among students is strictly prohibited.
- Text Book shall be issued to the students for a maximum period of 7 days.
- Request for reissuing the books will be entertained after one day.
- Students would be provided digital & online library facility.
- Books, maps, CDs, DVDs, E-books, etc. shall be issued to the students. Newspapers,

- Students would be provided photocopier facility in the library itself so that one can photocopy the material required from journals and magazines with charges.
- Borrowers shall be responsible for the safe return of the books to the library. While borrowing a book, student must ensure that book is in good condition. The student will have to replace the book or will pay double the price of the book, if any damage or loss of the book is noticed at the time of returning the book in the library.
- Bags, folders, personal books, magazines, big purses etc. are not allowed inside the library and are to be kept at property counter.
- Mobile phones are not allowed in the library.
- Visitors will not be entertained in the library.
- Silence must be maintained in the library.
- No book shall be taken away from the reading tables without permission of the librarian.
- Newspapers must not be removed from the newspaper stand.
- Scribbling/ underlining on the books is strictly prohibited. Two books at a time will be issued for a maximum period of one week.
- A fine of rupees 10 per day shall be charged if books are not returned within the specified time.
- When a Student is free from a class he should utilize Library or Computer lab facility rather than sitting idle.
- Ignorance of rules will not be taken as an excuse for breaking them.

DRESS CODE

FOR SUMMER	FOR WINTER
<ul style="list-style-type: none">• White Shirt• Grey Trouser• College Tie & Belt• Formal Black Shoes with Laces	<ul style="list-style-type: none">• Grey Blazer/Black Sweater• White Shirt• Grey Trouser• College Tie & Belt• Formal Black Shoes with Laces

ARYANS

ENVIRONMENTAL AWARENESS

1	1-7 July	Friday-Thursday	Vanmahotsava Week
2	11 July	Monday	World Population Day
3	16 September	Friday	International Ozone Day
4	11 October	Tuesday	International Girl Child Day
5	7 November	Monday	Infant Protection day; World Cancer Awareness Day
6	1 December	Thursday	World AIDS Day
7	10 December	Saturday	Human Rights day
8	2 December	Friday	Pollution Prevention Day

LIST OF HOLIDAYS

1.	Independence Day	Monday	15 th August
2.	Janmashtami	Thursday	25 th August
3.	Parkash Utsav Sri Guru Granth Sahib Ji	Friday	2 nd September
4.	Id-ul-Zuha (Bakrid)	Monday	12 th September
5.	Birthday of S. Bhagat Singh Ji	Wednesday	28 th September
6.	Birthday of Mahatma Gandhi Ji	Sunday	2 nd October
7.	Dussehra	Tuesday	11 th October
8.	Diwali	Sunday	30 th October
9.	Vishwakarma Day	Monday	31 th October
10.	Parkash Gurburab of Sri Guru Nanak Dev Ji	Monday	14 th November
11.	Christmas day	Sunday	25 th December

EVENT CHART

S.No.	DATE	DAY	EVENT
1	1 ST Sept	Thursday	Declamation (Management Students)
2	5 th Sept	Monday	Declamation (Engineering Students)
3	10 th Sept	Saturday	RAJNI Cultural Extravaganza
4	5 th Oct	Wednesday	AD- MAD Show
5	14 th Oct	Friday	World Standards Day- Extempore (Management & Engineering)
6	22 nd Oct	Saturday	Talent Hunt
7	23 rd Jan	Saturday	Girl Child Declamation
8	25 th Jan	Wednesday	Debate (Engineering)
9	26 th Jan	Thursday	Republic day
10	28 th Jan	Saturday	Blood Donate camp
11	18 th Feb	Saturday	Athletic Meet
12	7 th March	Tuesday	Debate- Women's Day
13	11 th March	Saturday	Ad – Mad Show
14	1 st to 8 th April	Saturday - Saturday	Roshaan(Annual function)

MARKING SCHEME FOR MST & FINAL EXAMINATION
Examination Specifications

MST Pattern

Max. Marks: 40

Time Allowed: 2 Hours

Section A: All Questions will be compulsory 10 Marks

Section B: Attempt only three out of four 30 Marks

Final Examination

Max. Marks: 60

Time Allowed: 3 Hours

Section A: All Questions will be compulsory 20 Marks

Section B: Attempt only five out of six 20 Marks

Section C: Attempt only two out of three 20 Marks

SEMESTER – III
(AUGUST-DECEMBER)

ACADEMIC CALENDER

Sr. No	Date	Day	Event
1	8 th Aug	Monday	Beginning of Classes
2	8 th -15 th Aug	Monday	Orientation Week
3	22 nd Aug	Monday	Talent Hunt
4	26 th Aug	Friday	Allotment of 1 st Assignment to Student
5	31 st Aug	Wednesday	1 Class test, 2 Case Studies (MBA),1 Case Study(B.Tech), 1 Case Study (BCA) & 1 Case Study (BBA) ; Presentation of 20% students in each subject
6	31 st Aug	Wednesday	Compilation of Attendance & completion of 25% of syllabus.
7	1 st Sept	Thursday	Declamation (Management Campus)
8	5 th Sept	Monday	Declamation (Engineering Campus)
9	6 th Sept	Tuesday	Showing the 1 st Assignment to Students
10	10 th Sept.	Saturday	“RAJNI-Cultural Extravaganza”
11	15 th Sept	Thursday	Celebration of Engineer’s Day
12	16 th Sept.	Friday	Quiz Competition
13	19 th -23 rd Sept	Monday- Thursday	Mid Semester Test- I
14	26 th Sep	Monday	Discussion of answer sheets with students & Compilation of Marks
15	1 st -30 th Sept	Thursday- Friday	1 Class test, 2 Case Studies (MBA),1 Case Study(B.Tech), 1 Case Study (BCA) & 1 Case Study (BBA) ; Presentation of 40% students in each subject
16	30 th Sept	Friday	Compilation of Attendance & completion of 60% of syllabus
17	3 rd Oct	Monday	Debate competition
18	5 th Oct.	Wednesday	AD- MAD Show
19	14 th Oct	Friday	Celebration of World Standards Day

20	15 th Oct	Saturday	Allotment of 2 nd Assignment
21	21 st Oct	Friday	Submission of 2 nd Assignment
22	26 th Oct	Wednesday	Showing the Assignment to students
23	1 st -31 th Oct	Thursday- Monday	1 Class test, 2 Case Studies (MBA), 1 Case Study (B.Tech), 1 Case Study (BCA) & 1 Case Study (BBA) ; Presentation of 40% students in each subject
24	30 th Oct	Monday	Compilation of attendance in each subject & Completion of 100% Syllabus
25	31 st -04 th Nov	Monday-Friday	Mid Semester Test-II
26	7 th -10 th Nov.	Monday-Thursday	Compilation of Marks & Attendance
27	2 nd week of Nov	Tentatively	Final Practical's
28	21 st Nov	Tentatively	End Semester Examination.

CSE COURSE STRUCTURE AND TEACHING SCHEME

SUBJECT CODE	SUBJECT	Internal Marks	External Marks	Total Marks
BTCS-301	Computer Architecture	40	60	100
BTCS-302	Mathematics-III	40	60	100
BTCS-303	Digital Circuit and Logic Design	40	60	100
BTCS-304	Data Structures	40	60	100
BTCS-305	Object Oriented Programming using C++	40	60	100
BTCS-306	Data Structures Lab	30	20	50
BTCS-307	Institutional Practical Training	60	40	100
BTCS-308	Digital Circuits and Logic Design Lab	30	20	50
BTCS-309	Object Oriented Programming using C++ Lab	30	20	50

BTCS 301 Computer Architecture

MST-1 SYLLABUS

UNIT-1

Register Transfer and Micro operations: Register transfer language & operations, arithmetic micro operations, logic micro operations, shift micro operations, arithmetic logic shift unit. Design of a complete basic computer and its working.

UNIT-II

Basic Computer Organization and Design: Instruction codes, Computer registers, Computer Instructions, Timing and control, Instruction Cycle, Memory reference instructions, Input/ Output and Interrupt, Design of basic Computer, Design of Accumulator Logic.

UNIT-III

Design of Control Unit: Control memory, design of control unit – micro programmed, hardwired, and their comparative study.

UNIT-IV

Central Processing Unit: General Register Organization, Stack Organization, Instruction formats, Addressing Modes, Data transfer and manipulations, Program control, RISC and CISC architecture.

MST-2 SYLLABUS

UNIT-V

Input-Output Organisation: Peripheral devices, I/O Interface, asynchronous data transfer, modes of transfer, priority interrupt, DMA, I/O processor, serial communication.

UNIT-VI

Memory Organisation: Memory hierarchy, main memory, auxiliary memory, associative memory, cache memory, virtual memory, memory management hardware.

UNIT-V

Advanced concepts of Computer Architecture: Concept of pipeline, Arithmetic pipeline, Instruction , vector processors and array processors. Introduction to parallel processing, Inter processor communication & synchronization.

Suggested Readings/ Books:

1. **M. Moris Mano**, Computer System Architecture, Pearson Education.
2. **William Stallings**, Computer Organisation and Architecture, Pearson Education.
3. **David A Patterson**, Computer Architecture, Pearson Education.
4. **P. Pal Choudhri**, Computer Organisation and Design, PHI.
5. **J. P. Hayes**, Computer System Architecture, Pearson Education.
6. **Kai Hawang**, Advanced Computer Architecture, Tata McGraw Hill.
7. **Riess**. Assembly Language and Computer Architecture and using C++ and JAVA, Cengage Learning.

BTAM302 Mathematics-III**MST -1****UNIT-I**

Fourier series: Periodic Functions, Euler's Formula. Even and odd Functions, Half range expansions, Fourier series of different waveforms. [4]

UNIT-II

Laplace transformations: Laplace transforms of various standard functions, properties of Laplace transform.

UNIT-III

Partial Differential Equations: Formation of Partial Differential Equations, linear Partial Differential Equations, Homogeneous Partial Differential Equations with constant coefficients.

UNIT-IV

Functions of complex variables: Limits, continuity and derivatives of the function of complex variables, Analytic function, Cauchy- Riemann equations, conjugate functions.

MST -II**UNIT-V**

Linear Systems and Eigen- Values: Gauss – elimination method, Gauss- Jordan method, Gauss- Seidel iteration method, Rayleigh's Power method for Eigen values and Eigenvectors.

UNIT-VI

Differential Equations: Solutions of Initial values problems using Euler's, modified Euler's method and Runge- kutta (upto fourth order) methods.

UNIT-VII

Probability distribution: Binomial, Poisson and Normal distribution.

UNIT-VIII

Sampling Distribution & testing of Hypothesis: Sampling, Distribution of means and variance, Chi-Square distribution, t- distribution, F- distribution. General concepts of hypothesis, Testing a statistical Hypothesis, One and two tailed tests, critical region, Confidence interval estimation. Single and two sample tests on proportion, mean and variance. [5]

Suggested Readings/ Books:

1. **E. Kreyszig,** "Advanced Engineering Mathematics", 5th Edition, Wiley Eastern 1985.
2. **P. E. Danko, A. G. Popov, T. Y. A. Kaznevnikova,** "Higher Mathematics in Problems and Exercise", Part 2, Mir Publishers, 1983.
3. **Bali, N. P.,** "A Text Book on Engineering Mathematics", Luxmi Pub., New Delhi.
4. **Peter V.O'Neil,** "Advanced Engineering Mathematics", Cengage Learning

BTEC303 Digital Circuit and Logic Design**MST I SYLLABUS****Unit I**

Number Systems: Binary, Octal, Decimal and Hexadecimal. Number base conversions, 1's, 2's, rth's complements, signed Binary numbers. Binary Arithmetic, Binary codes: Weighted BCD, Gray code, Excess 3 code, ASCII – conversion from one code to another.

Boolean Algebra : Boolean postulates and laws – De-Morgan's Theorem, Principle of Duality, Boolean expression – Boolean function, Minimization of Boolean expressions – Sum of Products (SOP), Product of Sums (POS), Minterm, Maxterm, Canonical forms, Conversion between canonical forms, Karnaugh map Minimization, Quine-McCluskey method - Don't care conditions.

Logic GATES: AND, OR, NOT, NAND, NOR, Exclusive-OR and Exclusive-NOR. Implementations of Logic Functions using gates, NAND-NOR implementations. Study of logic families like RTL, DTL, DCTL, TTL, MOS, CMOS, ECL and their characteristics.

Combinational Circuits: Design procedure – Adders, Subtractor, Serial adder/Subtractor, Parallel adder/ Subtractor Carry look ahead adder, BCD adder, Magnitude Comparator, Multiplexer/Demultiplexer, encoder/decoder, parity checker, code converters. Implementation of combinational logic using MUX.

MST II SYLLABUS**Unit II**

Sequential Circuits: Flip flops SR, JK, T, D and Master slave, Excitation table, Edge triggering, Level Triggering, Realization of one flip flop using other flip flops. Asynchronous/Ripple counters, Synchronous counters, Modulo-n counter, Ring Counters. Classification of sequential circuits-Moore and Mealy, Design of Synchronous counters: state diagram, Circuit implementation. Shift registers.

Memory Devices: Classification of memories, RAM organization, Write operation, Read operation, Memory cycle. Static RAM Cell-Bipolar, RAM cell, MOSFET RAM cell, Dynamic RAM cell. ROM organization, PROM, EPROM, EEPROM, Field Programmable Gate Arrays (FPGA).

Signal Conversions: Analog & Digital signals. A/D and D/A conversion techniques (Weighted type, R-2R Ladder type, counter Type, Dual Slope type, Successive Approximation type).

TEXT BOOK:

Digital Electronics by B.R Gupta, V. Singla (katson books)

REFERENCES:

Modern Digital electronics by Roger Tokheim (Tata Mc Graw hill)

Fundamentals of Digital Circuits by A Anand kumar (PHI publishers)

Digital design by Mano Ciletti (Pearson)

Unit VI

Operator Overloading and Type Conversion: Overloading operators, rules for overloading operators, overloading of various operators, type conversion - basic type to class type, class type to basic type, class type to another class type.

Unit VII

Inheritance: Introduction, defining derived classes, forms of inheritance, ambiguity in multiple and multipath inheritance, virtual base class, object slicing, overriding member functions, object composition and delegation, order of execution of constructors and destructors.

Unit VIII

Virtual functions & Polymorphism: Concept of binding - early binding and late binding, virtual functions, pure virtual functions, abstract classes, virtual destructors.

Unit IX

Exception Handling: Review of traditional error handling, basics of exception handling, exception handling mechanism, throwing mechanism, catching mechanism, rethrowing an exception, specifying exceptions.

Unit X

Templates and Generic Programming: Template concepts, Function templates, class templates, illustrative examples.

Unit XI

Files: File streams, hierarchy of file stream classes, error handling during file operations, reading/writing of files, accessing records randomly, updating files.

Suggested Readings/ Books:

- Lafore R., **Object Oriented Programming in C++**, Waite Group.
- E. Balagurusamy, **Object Oriented Programming with C++**, Tata McGraw Hill.
- R. S. Salaria, **Mastering Object-Oriented Programming with C++**, Salaria Publishing House.
- Bjarne Stroustrup, **The C++ Programming Language**, Addison Wesley.
- Herbert Schildt, **The Complete Reference to C++ Language**, McGraw Hill-Osborne.
- Lippman F. B, **C++ Primer**, Addison Wesley.

BTCS 304- Data Structures**MST I SYLLABUS****UNIT-I**

Dynamic Memory Management: Understanding pointers, usage of pointers, arithmetic on pointers, memory allocation, memory management functions and operators, debugging pointers - dangling pointers, memory leaks, etc.

UNIT-II

Introduction: Concept of data type, definition and brief description of various data structures, data structures versus data types, operations on data structures, algorithm complexity, Big O notation.

UNIT-III

Arrays: Linear and multi-dimensional arrays and their representation, operations on arrays, sparse matrices and their storage.

UNIT-IV

Linked List: Linear linked list, operations on linear linked list, doubly linked list, operations on doubly linked list, application of linked lists.

UNIT-V

Stacks: Sequential and linked representations, operations on stacks, application of stacks such as parenthesis checker, evaluation of postfix expressions, conversion from infix to postfix representation, implementing recursive functions.

UNIT-VI

Queues: Sequential representation of queue, linear queue, circular queue, operations on linear and circular queue, linked representation of a queue and operations on it, deque, priority queue, applications of queues.

MST II SYLLABUS**UNIT-VII**

Trees: Basic terminology, sequential and linked representations of trees, traversing a binary tree using recursive and non-recursive procedures, inserting a node, deleting a node, brief introduction to threaded binary trees, AVL trees and B-trees.

UNIT-VIII

Heaps: Representing a heap in memory, operations on heaps, application of heap in implementing priority queue and heap sort algorithm.

UNIT-IX

Graphs: Basic terminology, representation of graphs (adjacency matrix, adjacency list), traversal of a graph (breadth-first search and depth-first search), and applications of graphs.

UNIT-X

Hashing & Hash Tables: Comparing direct address tables with hash tables, hash functions, concept of collision and its resolution using open addressing and separate chaining, double hashing, rehashing.

UNIT-XI

Searching & Sorting: Searching an element using linear search and binary search techniques, sorting arrays using bubble sort, selection sort, insertion sort, quick sort, merge sort, heap sort, shell sort and radix sort, complexities of searching & sorting algorithms

TEXT BOOK:

Data Structures by Seymour Lipchitz (Tata McGraw Hill)

REFERENCES:

Data Structures by Tata McGraw Hill

BTCS 305 Object Oriented Programming Using C++**MST I SYLLABUS****Unit I**

Object-Oriented Programming Concepts: Introduction, comparison between procedural programming paradigm and object-oriented programming paradigm, basic concepts of object-oriented programming — concepts of an object and a class, interface and implementation of a class, operations on objects, relationship among objects, abstraction, encapsulation, data hiding, inheritance, overloading, polymorphism, messaging.

Unit II

Standard Input/Output: Concept of streams, hierarchy of console stream classes, input/output using overloaded operators >> and << and member functions of i/o stream classes, formatting output, formatting using ios class functions and flags, formatting using manipulators.

Unit III

Classes and Objects: Specifying a class, creating class objects, accessing class members, access specifiers, static members, use of *const* keyword, friends of a class, empty classes, nested classes, local classes, abstract classes, container classes, bit fields and classes.

Unit IV

Pointers and Dynamic Memory Management: Declaring and initializing pointers, accessing data through pointers, pointer arithmetic, memory allocation (static and dynamic), dynamic memory management using *new* and *delete* operators, pointer to an object, *this* pointer, pointer related problems - dangling/wild pointers, null pointer assignment, memory leak and allocation failures.

MST II SYLLABUS**Unit V**

Constructors and Destructors: Need for constructors and destructors, copy constructor, dynamic constructors, explicit constructors, destructors, constructors and destructors with static members, initializer lists.

Unit VI

Operator Overloading and Type Conversion: Overloading operators, rules for overloading operators, overloading of various operators, type conversion - basic type to class type, class type to basic type, class type to another class type.

Unit VII

Inheritance: Introduction, defining derived classes, forms of inheritance, ambiguity in

multiple and multipath inheritance, virtual base class, object slicing, overriding member functions, object composition and delegation, order of execution of constructors and destructors.

Unit VIII

Virtual functions & Polymorphism: Concept of binding - early binding and late binding, virtual functions, pure virtual functions, abstract classes, virtual destructors.

Unit IX

Exception Handling: Review of traditional error handling, basics of exception handling, exception handling mechanism, throwing mechanism, catching mechanism, re-throwing an exception, specifying exceptions.

Unit X

Templates and Generic Programming: Template concepts, Function templates, class templates, illustrative examples.

Unit XI

Files: File streams, hierarchy of file stream classes, error handling during file operations, reading/writing of files, accessing records randomly, updating files. [3]

Suggested Readings/ Books:

1. **Lafore R.**, Object Oriented Programming in C++, Waite Group.
2. **E. Balagurusamy**, Object Oriented Programming with C++, Tata McGraw Hill.
3. **R. S. Salaria**, Mastering Object-Oriented Programming with C++, Salaria Publishing House.
4. **Bjarne Stroustrup**, The C++ Programming Language, Addison Wesley.
5. **Herbert Schildt**, The Complete Reference to C++ Language, McGraw Hill-Osborne.
6. **Lippman F. B**, C++ Primer, Addison Wesley.
7. **Farrell**- Object Oriented using C++, Cengage Learning.

BTCS306 - Data Structures Lab**MST I SYLLABUS**

- Write a menu driven program that implement following operations (using separate functions) on a linear array:
 - Insert a new element at end as well as at a given position
 - Delete an element from a given whose value is given or whose position is given
 - To find the location of a given element
 - To display the elements of the linear array
- Write a menu driven program that maintains a linear linked list whose elements are stored in on ascending order and implements the following operations (using separate functions):
 - Insert a new element
 - Delete an existing element
 - Search an element
 - Display all the elements
- Write a program to demonstrate the use of stack (implemented using linear array) in converting arithmetic expression from infix notation to postfix notation.
- Program to demonstrate the use of stack (implemented using linear linked lists) in evaluating arithmetic expression in postfix notation.
- Program to demonstration the implementation of various operations on a linear queue represented using a linear array.
- Program to demonstration the implementation of various operations on a circular queue represented using a linear array.
- Program to demonstration the implementation of various operations on a queue represented using a linear linked list (linked queue).
- Program to illustrate the implementation of different operations on a binary search tree.
- Program to illustrate the traversal of graph using breadth-first search.
- Program to illustrate the traversal of graph using depth-first search.

- Program to sort an array of integers in ascending order using bubble sort.
- Program to sort an array of integers in ascending order using selection sort.
- Program to sort an array of integers in ascending order using insertion sort.
- Program to sort an array of integers in ascending order using radix sort.
- Program to sort an array of integers in ascending order using merge sort.
- Program to sort an array of integers in ascending order using quick sort.
- Program to sort an array of integers in ascending order using heap sort.
- Program to sort an array of integers in ascending order using shell sort.
- Program to demonstrate the use of linear search to search a given element in an array.
- Program to demonstrate the use of binary search to search a given element in a sorted array in ascending order.

ARYANS

BTEC-308 Lab Digital Circuit and Logic Design

1. Study of Logic Gates: Truth-table verification of OR, AND, NOT, XOR, NAND and NOR gates; Realization of OR, AND, NOT and XOR functions using universal gates.
2. Realization Half Adder / Full Adder using Logic gates.
3. Realization Half Subtractor / Full Subtractor using Logic gates
4. Design 4-Bit Binary-to-Gray & Gray-to-Binary Code Converter.
5. Design 4-Bit magnitude comparator using logic gates. Multiplexer: Truth-table verification and realization of Half adder and Full adder using MUX.
6. Demultiplexer: Truth-table verification and realization of Half subtractor and Full subtractor using DEMUX.
7. Flip Flops: Truth-table verification of RS, JK , D, JK Master Slave Flip Flops.
8. Design MOD-7 Synchronous up-counter using JK/RS/D Flip Flops.
9. Shift Register: Study of shift right, SIPO, SISO, PIPO, PISO & Shift left operations using IC7495 chip.

ARYANS

BTCS 309 Object Oriented Programming Using C++ Lab

1. **[Classes and Objects]** Write a program that uses a class where the member functions are defined inside a class.
2. **[Classes and Objects]** Write a program that uses a class where the member functions are defined outside a class.
3. **[Classes and Objects]** Write a program to demonstrate the use of static data members.
4. **[Classes and Objects]** Write a program to demonstrate the use of const data members.
5. **[Constructors and Destructors]** Write a program to demonstrate the use of zero argument and parameterized constructors.
6. **[Constructors and Destructors]** Write a program to demonstrate the use of dynamic constructor.
7. **[Constructors and Destructors]** Write a program to demonstrate the use of explicit constructor.
8. **[Initializer Lists]** Write a program to demonstrate the use of initializer list.
9. **[Operator Overloading]** Write a program to demonstrate the overloading of increment and decrement operators.
10. **[Operator Overloading]** Write a program to demonstrate the overloading of binary arithmetic operators.
11. **[Operator Overloading]** Write a program to demonstrate the overloading of memory management operators.
12. **[Typecasting]** Write a program to demonstrate the typecasting of basic type to class type.
13. **[Typecasting]** Write a program to demonstrate the typecasting of class type to basic type.
14. **[Typecasting]** Write a program to demonstrate the typecasting of class type to class type.
15. **[Inheritance]** Write a program to demonstrate the multilevel inheritance.
16. **[Inheritance]** Write a program to demonstrate the multiple inheritance.
17. **[Inheritance]** Write a program to demonstrate the virtual derivation of a class.
18. **[Polymorphism]** Write a program to demonstrate the runtime polymorphism.
19. **[Exception Handling]** Write a program to demonstrate the exception handling.
20. **[Templates and Generic Programming]** Write a program to demonstrate the use of function template.
21. **[Templates and Generic Programming]** Write a program to demonstrate the use of class template.
22. **[File Handling]** Write a program to copy the contents of a file to another file byte by byte. The name of the source file and destination file should be taken as command-line arguments.
23. **[File Handling]** Write a program to demonstrate the reading and writing of mixed type of data.

DATESHEET
MST I

DATE	DAY	MORNING	EVENING
		9:30 am-11:30am	2:30pm-4:00 pm
19 September	Monday	Data structure	Data structure lab
20 September	Tuesday	Engineering Mathematics III	Computer Architecture
21 September	Wednesday	Digital Circuit and Logic Design	Digital Circuit and Logic Design lab
22 September	Thursday	OOP using C++	OOP using C++ lab

DATESHEET
MST II

DATE	DAY	MORNING	EVENING
		9:30 am-11:30am	2:30pm-4:00 pm
31 October	Monday	Data structure	Data structure lab
1 November	Tuesday	Engineering Mathematics III	Computer Architecture
2 November	Wednesday	Digital Circuit and Logic Design	Digital Circuit and Logic Design lab
3 November	Thursday	OOP using C++	OOP using C++ lab

THIRD SEMESTER EXAMINATION – 2016

- Third Semester Examination will be conducted in the month of November & December.
- Date Sheet will be given by the Punjab Technical University; Generally University gives the date sheet before 2-3 weeks before the examination.

S. NO	DATE	DAY	SUBJECT
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

SEMESTER-IV (JANUARY-APRIL)

ARYANS

ACADEMIC CALENDER (Jan-April)

S. No.	Date	Day	Event
1	09 th Jan.	Monday	Beginning of Classes
2	20 th Jan.	Friday	Debate (Engineering Campus)
3	23 rd Jan.	Monday	Celebration of Girl Child Day
4	26 th Jan	Wednesday	Debate (Management Campus)
5	28 th Jan.	Saturday	Blood Donation Camp
6	09 th Jan-28 th Jan	Monday-Saturday	1 Class Test ; 2 Case Studies(MBA) , 1 Case Study (B.Tech) , 1 Case Study (BCA) & 1 Case Study (BBA) , Presentation of 20% Students in Each Subject
7	30 th Jan	Friday	Allotment of 1st Assignment
8	31 th Jan	Monday	Compilation of Attendance & Completion of 25% of Syllabus
9	4 th Feb	Saturday	Submission of 1st Assignment
10	6 th – 9 th Feb.	Monday-Thursday	MST-I
11	13 th Feb. -14 th Feb	Monday - Tuesday	Discussion of Answer Sheets With Students and Compilation of Marks.
12	18 th Feb.	Saturday	Athletic Meet
13	28 th Feb.	Tuesday	1 Class Test ; 2 Case Studies (MBA) , 1 Case Study (B.Tech) , 1 Case Study (BCA) & 1 Case Study (BBA) , Presentation of 60% Students in Each Subject
14	28 th Feb.	Tuesday	Compilation of Attendance & Completion of 60% of Syllabus
15	1 st Mar.	Wednesday	Allotment of 2 nd Assignment
16	7 th Mar.	Tuesday	Submission of 2 nd Assignment
17	7 th Mar.	Tuesday	Celebration Of International Women Day
18	11 th Mar.	Saturday	Ad – Mad Show
19	13 th Mar.-16 th Mar.	Monday-Thursday	MST-II
20	20 st Mar.-21 st Mar.	Monday-Tuesday	Discussion of Answer Sheets With Students and Compilation of Marks.

21	1 st Mar. – 31 st Mar.	Wednesday - Friday	1 Class Test, 2 Case Studies (MBA) , 1 Case Study (B.Tech) , 1 Case Study (BCA) & 1 Case Study (BBA) , Presentation of 40% Students in Each Subject
22	31 st Mar.	Friday	Compilation of Attendance & Completion of 100% of Syllabus.
23	1 st April-8 th April	Saturday-Saturday	Roshaan' - Cultural Extravaganza (Annual Function)
24	2 nd Week of April	Tentatively	Final Practical
25	21 st April	Tentatively	End Semester Examination

CSE COURSE STRUCTURE AND TEACHING **SCHEME**

SUBJECT CODE	SUBJECT	Internal Marks	External Marks	Total Marks
BTAM-401	Operating System	40	60	100
BTCS-402	Discrete structures	40	60	100
BTCS-403	Computer Networks-I	40	60	100
BTCS-404	Microprocessor and assembly Language	40	60	100
BTCS-405	System Programming	40	60	100
BTCS-406	Operating System Lab	30	20	50
BTCS-407	Computer Networks-I Lab	30	20	50
BTCS-408	Microprocessor and assembly Language Lab	30	20	50
BTCS-409	System Programming Lab	60	40	100
	General Fitness	100		100

BTCS 401 Operating Systems
MST I SYLLABUS

Unit I

1. Introduction to Operating system, Role of Operating System as resource manager, function of kernel and shell, operating system structures, views of an operating system.
2. **Process management:** CPU scheduling, Scheduling Algorithms, PCB, Process synchronization, Deadlocks, Prevention, Detection and Recovery
3. **Memory Management:** Overlays, Memory management policies, Fragmentation and its types, Partitioned memory managements, Paging, Segmentation, Need of Virtual memories, Page replacement Algorithms, Concept of Thrashing

MST II SYLLABUS

UNIT II

4. **Device Management:** I/O system and secondary storage structure, Device management policies, Role of I/O traffic controller, scheduler
5. **File Management:** File System Architecture, Layered Architecture, Physical and Logical File Systems, Protection and Security:
6. Brief study to multiprocessor and distributed operating systems.
7. **Case Studies:** LINUX / UNIX Operating System and Windows based operating systems. Recent trends in operating system.

Suggested Readings/ Books:

1. A Silberschatz and Peter B. Galvin, “**Operating System Concepts**” Addison Wesley Publishing Company
2. Dhamdhere, —**Systems Programming & Operating Systems**” Tata McGraw Hill
3. GaryNutt, “**Operating Systems Concepts**”, Pearson Education Ltd. 3rd Edition
4. **Operating System** by Madnick Donovan
5. **Operating System** by Stallings
6. Ida M.Flynn **Understanding Operating Systems** -, Cengage Learning.

BTCS402 Discrete Structures**MST I SYLLABUS****Unit I**

1. Sets, relations and functions: Introduction, Combination of Sets, ordered pairs, proofs of general identities of sets, relations, operations on relations, properties of relations and functions, Hashing Functions, equivalence relations, compatibility relations, partial order relations.

2. Rings and Boolean algebra: Rings, Subrings, morphism of rings ideals and quotient rings. Euclidean domains Integral domains and fields Boolean Algebra direct product morphisms Boolean sub-algebra Boolean Rings Application of Boolean algebra (Logic Implications, Logic Gates, Karnaughmap)

MST II SYLLABUS**Unit II**

3. Combinatorial Mathematics: Basic counting principles Permutations and combinations Inclusion and Exclusion Principle Recurrence relations, Generating Function, Application.

4. Monoids and Groups: Groups Semigroups and monoids Cyclic semigroups and submonoids, Subgroups and Cosets. Congruence relations on semigroups. Morphisms. Normal subgroups. Dihedral groups.

5. Graph Theory: Graph- Directed and undirected, Eulerian chains and cycles, Hamiltonian chains and cycles Trees, Chromatic number Connectivity, Graph coloring, Plane and connected graphs, Isomorphism and Homomorphism. Applications.

Suggested Readings/ Books:

1. Discrete Mathematics (Schaum series) by Lipschutz (McGraw Hill).
2. Applied Discrete Structures for Computer Science by Alan Doerr and Kenneth Levarseur.
3. Discrete Mathematics by N Ch SN Iyengar, VM Chandrasekaran.
4. Discrete Mathematics and Graph Theory(Cengage Learning) by Sartha
5. Discrete Mathematics and its Applications. Kenneth H Rosen.(McGraw Hill)
6. Elements of discrete mathematics. C L Liu (McGraw Hill)

BTCS403 Computer Networks–I
MST I SYLLABUS

Unit I

1. Introduction to Computer Networks:

Data Communication System and its components, Data Flow, Computer network and its goals, Types of computer networks: LAN, MAN, WAN, Wireless and wired networks, broadcast and point to point networks, Network topologies, Network software: concept of layers, protocols, interfaces and services, ISO-OSI reference model, TCP/IP reference model.

Unit II

2. Physical Layer:

Concept of Analog & Digital Signal, Bandwidth, Transmission Impairments: Attenuation, Distortion, Noise, Data rate limits : Nyquist formula, Shannon Formula, Multiplexing : Frequency Division, Time Division, Wavelength Division, Introduction to Transmission Media : Twisted pair, Coaxial cable, Fiber optics, Wireless transmission (radio, microwave, infrared), Switching: Circuit Switching, Message Switching ,Packet Switching & their comparisons.

Unit III

3. Data Link Layer:

Design issues, Framing, code, Data link protocols & Wait ARQ, Go-back-N
Error detection and correction codes: checksum, CRC, hamming for noisy and noiseless channels, Sliding Window Protocols: Stop ARQ, Selective repeat ARQ, Data link protocols: HDLC and PPP.

MST II SYLLABUS

Unit IV

4. Medium Access Sub-Layer:

Static and dynamic channel allocation, Random Access: ALOHA, CSMA protocols, Controlled Access: Polling, Token Passing, IEEE 802.3 frame format, Ethernet cabling, Manchester encoding, collision detection in 802.3, Binary exponential back off algorithm.

Unit V

5. Network Layer: Design issues, IPv4 classful and classless addressing, subnetting, Routing algorithms: distance vector and link state routing, Congestion control: Principles of Congestion Control, Congestion prevention policies, Leaky bucket and token bucket algorithms

Unit VI

6. Transport Layer: Elements of transport protocols: addressing, connection establishment and release, flow control and buffering, multiplexing and de-multiplexing, crash recovery, introduction to TCP/UDP protocols and their comparison. [3]

Unit VII

7. Application Layer: World Wide Web (WWW), Domain Name System (DNS), E-mail, File Transfer Protocol (FTP), Introduction to Network security

Suggested Readings/ Books:

1. Computer Networks, 4th Edition, Pearson Education by Andrew S. Tanenbaum
2. Data Communication & Networking, 4th Edition, Tata McGraw Hill. By Behrouz A. Forouzan.

3. Computer Networking, 3rd Edition, Pearson Education by James F. Kurose and Keith W. Ross
4. Internetworking with TCP/IP, Volume-I, Prentice Hall, India by Douglas E. Comer.
5. Guide to Networking Essentials, 5th Edition, Cengage Learning by Greg Tomsho,
6. Handbook of Networking, Cengage Learning by Michael W. Graves.

BTCS404 Microprocessors and Assembly Language Programming

MST I SYLLABUS

Unit I

1. Introduction: Introduction to Microprocessors, history, classification, recent microprocessors.

Unit II

2. Microprocessor Architecture: 8085 microprocessor Architecture. Bus structure, I/O, Memory & Instruction execution sequence & Data Flow, Instruction cycle. System buses, concept of address Bus, Data Bus & Control Bus, Synchronous & Asynchronous buses.

Unit III

3. I/O memory interface: Data transfer modes: Programmable, interrupt initiated and DMA. Serial & parallel interface, Detail study of 8251 I/O Processor & 8255 programmable

Unit IV

3. Instruction set & Assembly Languages Programming: Introduction, instruction & data formats, addressing modes, status flags, 8085 instructions, Data transfer operations, Arithmetic operations, Logical operations, Branch operations.

Unit V

5. Case structure & Microprocessor application: Interfacing of keyboards and seven segment LED display, Microprocessor controlled temperature system (MCTS), Study of traffic light system, stepper motor controller, Microprocessor based micro computers.

Unit VI

6. Basic architecture of higher order microprocessors: Basic introduction to 8086 family, Motorola 68000, Pentium processors. [5]

Suggested Readings/ Books:

1. Ramesh Gaonkar, "8085 Microprocessor", PHI Publications.
2. Daniel Tabak, "Advanced Microprocessors", McGraw- Hill, Inc., Second Edition 1995.
3. Douglas V. Hall, "Microprocessors and Interfacing: Programming and Hardware", Tata McGraw Hill Edition, 1986.
4. Charles M. Gilmore, "Microprocessors: Principles and Applications", McGraw Hill.
5. Ayala Kenneth, "The 8086 Microprocessor Programming and Interfacing", Cengage Learning

BTCS 405 System Programming**MST I SYLLABUS****Unit I**

1. Introduction: Introduction to system programming and different types of system programs editors, assemblers, macro-processors, compilers, linkers, loader, debuggers.

Unit II

2. Assemblers: Description of single pass and two pass assemblers, use of data structures like OPTAB and SYMTAB, etc.

Unit III

3. Macroprocessors: Description of macros, macro expansion, conditional and recursive macro expansion.

MST II SYLLABUS**Unit IV**

4. Compilers: Various phases of compiler – lexical, syntax and semantic analysis, intermediate code generation, code optimization techniques, code generation, Case study : LEX and YACC.

Unit V

5. Linkers and Loaders: Concept of linking, different linking schemes, concept of loading and various loading schemes.

Unit VI

6. Editors: Line editor, full screen editor and multi window editor, Case study MS-Word, DOS Editor and vi editor.

Unit VII

7. Debuggers: Description of various debugging techniques.

Suggested Readings/ Books:

1. Donovan J.J., “**Systems Programming**”, New York, Mc-Graw Hill, 1972.
2. Dhamdhere, D.M., “**Introduction to Systems Software**”, Tata Mc-Graw Hill, 1996.
3. Aho A.V. and J.D. Ullman ,”**Principles of compiler Design**” AddisonWesley/ Narosa 1985.
4. Kenneth C. Loudon,” **Compiler Construction**”, Cengage Learning.

BTCS 406 Operating System Lab

1. Installation Process of various operating systems
2. Virtualization, Installation of Virtual Machine Software and installation of Operating System on Virtual Machine
3. Commands for files & directories: cd, ls, cp, md, rm, mkdir, rmdir. Creating and viewing files using cat. File comparisons. Disk related commands: checking disk free spaces. Processes in linux, connecting processes with pipes, background processing, managing multiple processes. Manual help. Background process: changing process priority, scheduling of processes at command, batch commands, kill, ps, who, sleep. Printing commands, grep, fgrep, find, sort, cal, banner, touch, file. File related commands ws, sat, cut, grep.
4. Shell Programming: Basic of shell programming, various types of shell, Shell Programming in bash, conditional & looping statement, case statements, parameter passing and arguments, shell variables, shell keywords, creating shell programs for automate system tasks, report printing.

BTCS 407 Computer Networks-I Lab

1. Write specifications of latest desktops and laptops.
2. Familiarization with Networking Components and devices: LAN Adapters, Hubs, Switches, Routers etc.
3. Familiarization with Transmission media and Tools: Co-axial cable, UTP Cable, Crimping Tool, Connectors etc.
4. Preparing straight and cross cables.
5. Study of various LAN topologies and their creation using network devices, cables and computers.
6. Configuration of TCP/IP Protocols in Windows and Linux.
7. Implementation of file and printer sharing.
8. Designing and implementing Class A, B, C Networks
9. Subnet planning and its implementation
10. Installation of ftp server and client

ARYANS

BTCS408 Microprocessor and Assembly Language Programming
Lab

1. Introduction to 8085 kit.
2. Addition of two 8 bit numbers, sum 8 bit.
3. Subtraction of two 8 bit numbers.
4. Find 1's complement of 8 bit number.
5. Find 2's complement of 8 bit number.
6. Shift an 8 bit no. by one bit.
7. Find Largest of two 8 bit numbers.
8. Find Largest among an array of ten numbers (8 bit).
9. Sum of series of 8 bit numbers.
10. Introduction to 8086 kit.
11. Addition of two 16 bit numbers, sum 16 bit.
12. Subtraction of two 16 bit numbers.
13. Find 1's complement of 16 bit number.
14. Find 2's complement of 16 bit number.

BTCS 409 System Programming Lab

1. Create a menu driven interface for
 - a) Displaying contents of a file page wise
 - b) Counting vowels, characters, and lines in a file.
 - c) Copying a file
2. Write a program to check balance parenthesis of a given program. Also generate the error report.
3. Write a program to create symbol table for a given assembly language program.
4. Write a program to create symbol table for a given high-level language program.
5. Implementation of single pass assembler on a limited set of instructions.
6. Exploring various features of debug command.
7. Use of LAX and YACC tools.

DATESHEET
MST I

DATE	DAY	MORNING	EVENING
		9:30 am-11:30am	2:30pm-4:00 pm
6 th February	Monday	Operating system	Operating system lab
7 th February	Tuesday	Computer Network-I	computer network-I lab
8 th February	Wednesday	Microprocessor and Assembly language programming	Microprocessor and Assembly language programming lab
9 th February	Thursday	System programming	System programming lab
10 th February	Friday	Discrete structure	

DATESHEET
MST II

DATE	DAY	MORNING	EVENING
		9:30 am-11:30am	2:30pm-4:00 pm
13 th March	Monday	Operating system	Operating system lab
14 th March	Tuesday	Computer Network-I	computer network-I lab
15 th March	Wednesday	Microprocessor and Assembly language programming	Microprocessor and Assembly language programming lab
16 th March	Thursday	System programming	System programming lab
17 th March	Friday	Discrete structure	

FOURTH SEMESTER EXAMINATION – 2017

- Fourth Semester Examination will be conducted in the month of November and December.
- Date Sheet will be given by the Punjab Technical University; Generally University gives the date sheet before 2-3 weeks before the examination.

S. NO	DATE	DAY	SUBJECT
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			