

INSTITUTE OF ADVANCED STUDIES
IN EDUCATION (DEEMED UNIVERSITY)
GANDHI VIDYA MANDIR
SARDAR SHAHR

DETAILED SYLLABUS

FOR DISTANCE EDUCATION

Post-Graduate Degree Programmes

MASTER IN INFORMATION TECHNOLOGY

(SEMESTER SYSTEM)

COURSE TITLE : **MASTER IN INFORMATION TECHNOLOGH**
DURATION : **02 YEARS (SEMESTER SYSTEM)**
TOTAL MARKS : **2000**

FIRST SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
INTERNET & WEB DESIGNING	MIT-110/ MIT-110P	50	50	100
OBJECT ORIENTED PROGRAMMING IN C++	MIT-120/ MIT-120P	50	50	100
DATA BASE MANAGEMENT SYSTEM	MIT-130/ MIT-130P	50	50	100
INTRODUCTION TO IT	MIT-140	100	00	100
DATA STRUCTURE	MIT-150/ MIT-150P	50	50	100

SECOND SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
OBJECT ORIENTED ANALYSIS & DESIGN	MIT-210	100	00	100
OPERATING SYSTEM	MIT-220	100	00	100
SOFTWARE ENGINEERING & QUALITY ASSURANCE	MIT-230	100	00	100
PROGRAMMING IN JAVA	MIT-240/ MIT-240P	50	50	100
MINOR PROJECT	MIT-250P	00	100	100

THIRD SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
COMPUTER SYSTEM ARCHITECTURE	MIT-310	100	00	100
MICROPROCESSOR & INTERFACE DESIGN	MIT-320	100	00	100
DIGITAL ELECTRONICS	MIT-330/ MIT-330P	50	50	100
SYSTEM ADMINISTRATION & SECUIRITY MANAGEMENT	MIT-340/ MIT-340P	50	50	100
DISCRETE MATHEMATICS	MIT -350	100	00	100

FOURTH SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
PROGRAMMING USING C#	MIT-410/ MIT-410P	50	50	100
NUMERICAL METHODS	MIT-420	100	00	100
ANALYSIS & DESIGN OF ALGORITHM	MIT-430	100	00	100
MAJOR PROJECT	MIT-440 P	00	200	200

FIRST SEMESTER

MIT-110

INTERNET & WEB DESIGNING

Maximum Time : 3 Hrs. University Examination : 35 Marks
Total Marks : 50 Continuous Internal Assessment : 15 Marks
Minimum Pass Marks : 40%

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Definition of Internet. Internet organisation and committees, Internet, Growth of Internet, Internet-3, Anatomy of Internet, Internet Application, Portals, Introduction about www. Definition of DNS (Domain Name System). IP Addressing.

SECTION B

Definition of Networks, Types of Network, Topologies, PSTN, PSDN, VAN, ISDN, PDNs, Wide Area Network, Introduction about search engines (Mozilla, Netscape, Opra) Email, Introduction about main protocol (SMTP, MIME, X.25, Frame relay, PPP, NNTP etc.)

SECTION C

OSI Reference method, TCP/IP model, FTP, HHTTP, HTTPS, Addressing in Internet (Class A,B,C,D,E) Definition of Ethernet, Intranet, Telnet, Wireless communication, Virtual Circuits, ISDN model, CSMA/CD. Explanation of all layers of OSI and TCP/IP model.

Introduction about HTML., Tag, Types of Tags, Forms, Tables, Images insertion in web page, Introduction about DMTL, CGI, Introduction about XML.

Reference:-

1. Tananbaum A.S., "Computer Networks", 3rd Ed, PHI, 1999
2. D.E. Comer, "Computer Networks and Internet", (2nd Edition), Addison wisely, 2000.
3. D. Bertsekas and R.Gallagar, "Data Networks", 2nd Edition, Prentice-Hall, 1992.
4. Frozan, "Data Communications & Networks "(2nd Edition), TMH

MIT-110P

INTERNET & WEB DESIGNING

Maximum Time : 3 Hrs. University Examination : 35
Total Marks : 50 Continuous Internal Assessment : 15
Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MIT-110

Maximum Time : 3 Hrs. **University Examination** : 35
Total Marks : 50 **Continuous Internal Assessment** : 15
Minimum Pass Marks : 40%

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

OOP Paradigm, Advantages of OOP, Comparison between Functional Programming and OOP Approach, Characteristics of Object Oriented Language-objects, Classes, Inheritance, Reusability, User defined Data Types, Polymorphism, and Overloading. Introduction to C++, Identifier and keywords, Constants, C++ Operators, Type conversion, Variable declaration, statements, expressions, conditional expression, loop statements, control statements (Break, Continue etc.).

SECTION B

Defining a function, types of functions, call by value & call by reference, pre-processor, header files and standard functions, structures, pointers and structures, unions, Enumeration.

Classes, member functions, objects, arrays of class objects, nested classes, constructors, destructors, inline member functions, static class member, friend functions, dynamic memory allocation.

Inheritance, Single inheritance, Multiple inheritance, Virtual base class, Abstract classes, Constructors in derived classes, Nesting of classes.

SECTION D

Function overloading, operator overloading, polymorphism, early binding, polymorphism with pointers, virtual functions, late binding, pure virtual functions, opening and closing of files, stream state member functions, binary file operations, structures and file operations, classes and file operations, random access file processing.

References:

1. D. Ravichandran, "Programming with C++", TMH, 1996.
2. Robert Lafore, "Object Oriented Programming in Turbo C++", Galgotia Publications, 1994.
3. Bjarne Stroustrup, "The C++ Programming Language", Addison- Wesley Publication Co., 1995.

Maximum Time : 3 Hrs. **University Examination** : 35
Total Marks : 50 **Continuous Internal Assessment** : 15
Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MIT-120.

MIT-130

DATA BASE MANAGEMENT SYSTEM

Maximum Time : 3 Hrs. University Examination : 35
Total Marks : 50 Continuous Internal Assessment : 15
Minimum Pass Marks : 40%

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Database V/s File system, Architecture of DBMS (External, Conceptual, Internal), Data Independence (Logical Physical) DBA and his responsibility, DBMS structure (DDL Compiler, Data manager, File manager, Disk Manager, Query Processor).

SECTION B

Entity, Entity Set, Attributes Keys (Primary, Secondary, Candidate, Super, Alternate), Mapping cardinalities, N-array relationships, E-R- Diagram, Hierarchical Model, Relational Model, Network Model, Object oriented Model, Mapping of E-R diagrams to tables.

Anomalies in Design, Functional Dependency, Logical implications, Closure of FD, Canonical Core, Full and Partial FD, Prime and Non-prime attributes, 1-NF, 2-NF, 3-NF, BCNF, Decompositions, lossless and Dependency perseverance.

SECTION C

Integrity rules (Entity integrity, Referential Integrity) Union, Difference, Intersection, Cartesian product Division, Projection, Selection, Joins.

Type calculus, Type calculus Formula, Domain calculus, SQL, Basic data retrieval, Data manipulation and table study comments, views, Recovery techniques, check points, concurrency control, View & conflict serializability, Lock, based concurrency control, strict two phase locking, multiple granularity locking, time stamp based concurrency control.

References:

1. Bipin C. Desai, "An Introduction to Database Systems", Galgotia Publications Nt. Ltd.
2. Elmarni Navathe, "Fundamental of Database Systems", Pearson Edition.
3. C.J. Date, "An Introduction to Database System", (7th Edition) Pearson Edition.

MIT-130P

DATA BASE MANAGEMENT SYSTEM

Maximum Time : 3 Hrs. University Examination : 35 Marks
Total Marks : 50 Continuous Internal Assessment : 15 Marks
Minimum Pass Marks : 40%

The laboratory course will comprise of Exercises on what is learnt in the theory classes of the same course i.e. MIT -130.

Maximum Time : 3 Hrs.

University Examination : 70

Total Marks : 100

Continuous Internal Assessment : 30

Minimum Pass Marks : 40%

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Definition of Information Technology, Use of IT, Definition of information system, need of information system, definition of knowledge, Range of application : Scientific, business, educational, whether forecasting, and remote sensing, planning, e-commerce, web publishing, Management Information System, Decision Support System, inventory control, medical, industrial control, banks, railways, etc.

SECTION B

Computer Fundamentals: Block structure of computer, Characteristics of computers, Problem solving with computers, Generation of computers, Classification of computers.

Number System : Bit, Byte, Binary, Decimal, Hexadecimal, and Octal system, Conversion from one system to the other, Error detecting codes, Representation of characters, Integers and fractions.

Binary Arithmetic: Addition, Subtraction and Multiplication.

SECTION C

Input and Output units: Their functional characteristics, main memory , cache memory read only memory, overview of storage devices – floppy disk, hard disk, compact disk, tape.

Computer Networks and Communication : Network types, Network topologies, Network communication devices, Physical communication media, TCP/IP.

Internet and its Applications : E-mail, Telnet, FTP, WWW, Internet chatting.

References:

1. D. H. Sanders, "Computers Today", McGraw Hill, 1988.
2. T. N. Trainer, "Computers" (4th Edition) McGraw Hill, 1994.
3. V. Rajaraman, "Fundamentals of Computers" (2nd edition), Prentice Hall of India, New Delhi, 1996.
4. B. Ram, "Computer Fundamentals", Wiley, 1997.

MIT-150**DATA STRUCTURE**

Maximum Time : 3 Hrs. University Examination : 35
Total Marks : 50 Continuous Internal Assessment : 15
Minimum Pass Marks : 40%

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Space and time complexity, Asymptotic notations ($\Omega, \theta, O, \omega, o$), Arrays :- One Dimension and two Dimensional Arrays (Storage in Row – major & column major order).

Queue Structures: Insertion, deletion, Priority Queue, D-Queue.

Stack:- Push, Pop operations, Polish notation, Algorithm for Infix to Postfix conversion, Evaluation of Postfix expression.

Link lists, singly link list, Doubly link list, advantage and disadvantage.

SECTION B

Tree basic concept, Tree representation by link list and by arrays, Binary tree, Binary search tree (Operations:- Insertion, Deletion, Traversals), Heap sort, AVL, B-tree.

Graph concepts, Adjacency list and adjacency matrix representation, DFS, BFS, Topological sorting, strongly connected components, Prim's & Kruskal's algorithm, Dijkstra's algorithm, Warshall's algorithm.

SECTION C

Linear search, Binary search, Bubble sort, selection sort, Insertion sort, Quick sort, Heap sort, Merge sort, Bucket sort, Radix sort and their Comparison in terms of space & time complexity.

References:

1. Sartaj Sahni, "Data structures Algorithms and Applications in C++", TMH.

MIT-150P**DATA STRUCTURE**

Maximum Time : 3 Hrs. University Examination : 35 Marks
Total Marks : 50 Continuous Internal Assessment : 15 Marks
Minimum Pass Marks : 40%

The laboratory course will comprise of Exercises on what is learnt in the theory classes of the same course i.e. MIT -150.

SECOND SEMESTER

MIT-210

OBJECT ORIENTED ANALYSIS & DESIGN

Maximum Time : 3 Hrs. University Examination : 70
Total Marks : 100 Continuous Internal Assessment : 30
Minimum Pass Marks : 40%

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Introduction to Object: Object Orientation, Development, Modeling, Object Modeling technique. Object modeling: Objects and classes, Links and Association, Generalization and inheritance, Grouping constructs, Aggregation, Generalization as extension and restriction, Multiple inheritance, Meta data, candidate keys.

SECTION B

Dynamic modeling: Events and states, Nesting, Concurrency, Functional modeling: Data flow diagrams, Specifying operations. Design Methodology, Analysis: Object modeling, Dynamic modeling, Functional modeling, Adding operations, Iteration.

SECTION C

System design: Subsystems Concurrency, Allocation to processor and tasks. Management of data stores. Control implementation. Boundary condition. Architectural frameworks. Object design: Optimization, implementation of control. Adjustment of inheritance. Design of association. Documentation. Comparison of methodologies.

Object -Oriented styles, Implementation: Using a programming language, a database system. Programming styles reusability, extensibility, robustness, programming-in-the-large, case study.

References:

1. Rambough, "Object Oriented Modeling and Design", PHI.
2. BOOCH, "Object Oriented Analysis and Design", Addison Wesley.
3. Rebecca Wirfs-Brock, "Design Object Oriented Software", PHI.

Maximum Time : 3 Hrs.
Total Marks : 100
Minimum Pass Marks : 40%

University Examination : 70
Continuous Internal Assessment : 30

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Basics of Operating System, Batch processing, Multi-programming. Multi-tasking, time sharing parallel computing, distributed computing, process concepts, process state, PCB, content switch, cooperating processes, Inter process communication, user Threads and kernel threads, Threading in Unix
CPU Scheduling algorithms (FCFS, SJF, RR, Printing), scheduling in Unix.

SECTION B

Process Synchronization, Peterson's algorithm, Bakery algorithm, Semaphores, classical problems (Bounded buffer, reader-writer, Dining Philosopher), Deadlock prevention and deadlock avoidance, Bakery algorithm, swapping, paging and segmentation, virtual memory, Demand paging, page replacement algorithms.

SECTION C

Unix commands (Is, we, sort, cut, grep, dd, directory commands etc.) Type of shells, Unix File system, file permissions, I node, piping, ve editor, processes in unix (Changing priority, killing priorities, scheduling process. Communication related commands, Decision and Looping constructs in unix shell programming shell programs).

References:

1. Silberschatz and Galvin, "Operating System Concepts", 5th Edition Addison-wesley Pub. Co. 1999
2. Haryen, Per Brivch, "Operating System Principles", PHI, 1984
3. Yashwant Kanetkar, "UNIX, SHELL programming", BPD Publications

Maximum Time : 3 Hrs.
Total Marks : 100
Minimum Pass Marks : 40%

University Examination : 70
Continuous Internal Assessment : 30

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Software crises, Software myths, Software process models: Waterfall. Spiral, prototyping, RAD, comparison of different lifecycle models, metrics for project size estimation (LOC, Function point metric).

Cost estimation model: COCOMO model, Staffing Level Management (Norden's Model, Putnam's model)

Scheduling: work Breakdown Structure, Activity networks and CPM, PERT charts.

SECTION B

Risk identification, Risk assessment, Risk containment, Configuration Management Activities.

Software Testing: Verification Vs Validation, Design of test cases, Unit Testing – Driver and stub modules, Black Box Testing – Equivalence class partitioning, Boundary Value Analysis, White Box Testing- Cyclometric complexity metric, Data flow based Testing, Mutation Testing, Integration Testing and System Testing.

SECTION C

Software Reliability – Hardware Vs Software Reliability, Reliability metrics, Reliability Growth modeling, Software Quality, ISO Standards, SEI Capability maturity model, Software Quality, Quality Control, Quality assurance issues, Formal Technical Review, Statistical Software Quality assurance, Formal approaches to SQA.

References:

1. Rajib mall, "Fundamentals of software engineering", PHI.
2. P. Jalote, "An Integrated Approach to Software Engineering Second Edition ", Narosa Publishing House.
3. Roger S Pressman, "Software Engineering - A Practitioner's Approach 5th edition", TMH.

MIT-240**PROGRAMMING IN JAVA**

Maximum Time : 3 Hrs. **University Examination** : 35arks
Total Marks : 50 **Continuous Internal Assessment** : 15arks
Minimum Pass Marks : 40%

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Introduction to Java: Features of Java, difference between Java and C++, data types, variables, arrays, operators-arithmetic, bitwise, relational, Boolean, various control statements.

Introduction to Classes: Class fundamentals, declaring objects, methods, constructors, garbage collection, passing parameters to methods, recursion, access control, static, final and finally method, Array Single dimensional, Multidimensional array.

SECTION B

Inheritance, Super, Multilevel Hierarchy, Abstract methods and classes. Packages and interfaces, importing packages, exception handling. Exception types, try, catch, finally, throw and throws, creating exception subclasses. Multithread programming, thread priorities, synchronization, Messaging, Creating Multiple threads, Inter thread communication.

SECTION C

Networking, Socket overview, Client/server, Reserved Sockets, Proxy Servers, Internet Addressing, Java and the Net, TCP/IP client sockets. An introduction to AWT, GUI graphics, fonts, colours, Introduction of Servlet, Servlet Lifecycle, JSP, JSP lifecycle.

References:

1. Patrick Naughton and Herbert Schildt, "The Complete Reference Java 2", Tata McGraw Hill, 1999.
2. E. Balaguru Swami, "Programming with Java(2nd Edition), TMH.

MIT-240P**PROGRAMMING IN JAVA**

Maximum Time : 3 Hrs. **University Examination** : 35arks
Total Marks : 50 **Continuous Internal Assessment** : 15arks
Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MIT-240.

MIT-250P**MINOR PROJECT**

Maximum Time : 3 Hrs.
Total Marks : 100
Minimum Pass Marks : 40%

University Examination : 70
Continuous Internal Assessment : 30

1. Students are supposed to spend 45-55 hours on the project. The internal teacher must monitor progress of the Project. Students can arrange the project at their own level, however, Institute can also assist in getting the project and can issue necessary letters etc.
2. The external examiner will distribute marks allocated for University examination for viva/project report and for any other activity, which the external examiner thinks to be proper Maximum Marks for project Application **60%** Max marks for Viva **40%**
3. Joint Projects will be allowed and joint project reports will also be accepted. The students should highlight their contributions in a joint project report
4. The student has to submit two copies of Project reports. The examiners will evaluate these reports on the spot at the time of examination and will conduct the viva.

THIRD SEMESTER

MIT-310

COMPUTER SYSTEM ARCHITECTURE

Maximum Time : 3 Hrs.

University Examination : 70

Total Marks : 100

Continuous Internal Assessment : 30

Minimum Pass Marks : 40%

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

The Computer System

System buses: Computer components, computer function, Interconnection Structures, Bus Interconnection, PCI

Internal Memory: Computer Memory System Overview, Semiconductor Main memory, Cache Memory Advanced DRAM Organization

Input/Output: External Devices, I/O Modules, Programmed I/O Interrupt-Driven I/O, Direct Memory Access, I/O Channels the External Interface.

SECTION B

Computer Arithmetic: The Arithmetic and Logic Unit (ALU), Integer Arithmetic, Floating-Point Representation, Floating-Point Arithmetic

Instruction Sets: Characteristics and Function, Machine Instruction Characteristic, Types of Operands, Types of Operations, Addressing Modes and formats, Register Organization, The Instruction Cycle, Instruction Pipelining.

SECTION C

Assembly Language

The Control Unit: Micro-operation, control of the CPU, hardwired Implementation, Micro program Controller, Basic Concepts, Microinstructions, Sequencing. Microinstruction Execution Reduced Instruction Set Computers: An Introduction.

References:

1. M. Mano, "Computer System Architecture" 3rd Edition, Prentice-Hall India
2. W. Stallings, "Computer organization and Architecture", 4th Edition, Prentice-Hall India
3. Harry, Jordan, "Computer Systems Design & Architecture", Edition Addison Wesley
4. J.P. Hayes, "Computer Architecture and Organization", McGraw Hill

Maximum Time : 3 Hrs. **University Examination** : 70
Total Marks : 100 **Continuous Internal Assessment** : 30
Minimum Pass Marks : 40%

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Introduction to Microprocessors: Evolution of Microprocessor, Microcontroller, Embedded Microprocessor, Bit-Slice Processors, Microprogramming, RISC Vs CISC, Scalar and Super Scalar Processors, Vector, Symbolic and Array Processors, Digital Signal Processors, Transporters, Microprocessor with MMX technology, Different architectures of computers

16 bit Intel Processor: Intel 8086, Intel 80186, 80286, 8088 and 80188. Instruction set of 8086.

SECTION B

Assembly Language of 8086, Debug and Assembler: Various Debug commands, Assembler Embedded Control, I/O Control and Co-Processor.

Intel 386 and 486 Microprocessors: 486Dx architecture, pin description, register organization, BIU and EU, Interrupts and exceptions of 80486, Lock, addressing modes of 80486, Protection and Gates of 80486.

SECTION C

Input/Output Devices, Memory and I/o addressing. 8086 Addressing and Decoding, Programmable I/O Ports, DMA, Interrupt controller, Memory controller, Floppy Disk controller, Hard Disk Interface, display interface, communication interface, Advanced Integrated Peripheral, Integrated system Peripheral, Multifunction Microprocessor, APIC, IOAPIC.

Other Microprocessors: Power Pc Microprocessor, Pentium Pro, Alpha, Cyrix, MIPS, SUN and SPARK Microprocessors.

Reference:

1. Badri Ram, "Advanced Microprocessor and Interfacing", TMH.

MIT-330**DIGITAL ELECTRONICS**

Maximum Time : 3 Hrs.
Total Marks : 50
Minimum Pass Marks : 40%

University Examination : 35
Continuous Internal Assessment : 15

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Fundamental Concepts: digital signal, NAND, NOR and Exclusive- OR operation, Boolean Algebra, Basic Digital Circuits.

Number system and Codes: primary, Octal, Hexadecimal, signed numbers codes, hamming codes.

SECTION B

Combinational Logic Design: K-map Representation of logical functions and simplification using K-map of 4 and 5 variables, Quine – McCluskey's method.

Multiplexers, Demultiplexers, Adders and Subtractors, multipliers, Comparators, Parity generators and checkers, Code converters, Priority Encoders, Decoders.

SECTION C

Races, hazards, and asynchronous behavior.

Flip-Flops: Clocked RS flip flop, D-type flip flop, Excitation table of flip flop, Edge triggered flip flop, Clocked flip flop design.

Sequential Logic Designs: Registers, Shift registers, Asynchronous counters, synchronous counters, RAM, ROM.

References:

1. Malvino, "Digital principles and Applications", Tata McGraw Hill, 4th Edition.
2. M. Ercegovac, T. Lang, J. H. Moreno, "Introduction to Digital Systems", John Wiley and Sons.

MIT-330P**DIGITAL ELECTRONICS**

Maximum Time : 3 Hrs.
Total Marks : 50
Minimum Pass Marks : 40%

University Examination : 35
Continuous Internal Assessment : 15

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MIT-330.

MIT-340 SYSTEM ADMINISTRATION & SECURITY MANAGEMENT

Maximum Time : 3 Hrs. **University Examination** : 35
Total Marks : 50 **Continuous Internal Assessment** : 15
Minimum Pass Marks : 40%

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Introduction to Java: Features of Java, difference between Java and C++, data types, variables, arrays, operators-arithmetic, bitwise, relational, Boolean, various control statements.

SECTION B

Introduction to Classes: Class fundamentals, declaring objects, methods, constructors, garbage collection, passing parameters to methods, recursion, access control, static, final and finally method, Array Single dimensional, Multidimensional array.

SECTION C

Inheritance, super, multilevel hierarchy, abstract methods and classes. Packages and interfaces, importing packages, exception handling. Exception types, try, catch, finally, throw and throws, creating exception subclasses. Multithread programming, thread priorities, synchronization, messaging, creating multiple threads, inter thread communication.

SECTION D

Networking, socket overview, client/server, reserved sockets, proxy servers, Internet addressing, Java and the Net, TCP/IP client sockets. An introduction to AWT, GUI graphics, fonts, colours, Introduction of servlet, servlet lifecycle, JSP, JSP lifecycle.

References:

1. Patrick Naughton and Herbert Schildt, "The Complete Reference Java 2", Tata McGraw Hill, 1999.
2. E. Balaguru Swami, "Programming with Java"(2nd Edition), TMH.

MIT-340P SYSTEM ADMINISTRATION & SECURITY MANAGEMENT

Maximum Time : 3 Hrs. **University Examination** : 35
Total Marks : 50 **Continuous Internal Assessment** : 15
Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MIT-340.

MIT-350

DISCRETE MATHEMATICS

Maximum Time : 3 Hrs. University Examination : 70
Total Marks : 100 Continuous Internal Assessment : 30
Minimum Pass Marks : 40%

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Sets and subsets, operations on sets.(union, Intersection, complement, Difference, Symmetric Difference) Cartesian Products, Relations and Digraphs, Properties of Relation, Equivalence relation, Transitive closure matrices, operations on matrices, determinants.

SECTION B

Proposition and logical operations, Compound statements quantifiers, Conditional statements, Mathematical induction, Permutation, multiplication, principle of counting. Combinations, Pigeon for principle

SECTION C

Poset, External elements of poset, lattice Boolean algebras, groups, semi-groups, product and quotients of groups and semi groups., Graphs ruler path & circuits, Hamiltonian path and circuits, Graph coloring, Trees, labeled trees, tree searching, Binary tree, Minimum spanning trees

Reference:

1. Bounard Kolman, Robert C. Busby, Sharon Rose, "Discrete Mathematic Structures", 3rd Edition PHI NE, Ltd.

FOURTH SEMESTER

MIT-410

PROGRAMMING USING C#

Maximum Time : 3 Hrs.

University Examination : 35

Total Marks : 50

Continuous Internal Assessment : 15

Minimum Pass Marks : 40%

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

.Net framework, Common language runtime, Framework Base classes, User and Program Interfaces, Visual Studio. NET, NET languages, Benefits of . NET Application C# and . NET.

Name Spaces, Main Returning a value , Passing string objects write line method. Command line arguments, using mathematics functions, Literals, Variables, Operators, Expressions.

Decision making (if, if.....else, Nested if, else.... If ladder, Switch , ? : Operator) Looping (While, do , for , for each Jumps in loops)

SECTION B

Methods, Parameters, Pass by value, Pass by reference, Methods overloading, Arrays, Strings, Structures, Enumerations, Difference between class & structure.

Classes, access modifiers, accessing class members, constructors, overloaded constructors, copy constructors, destructors.

SECTION C

Classical Inheritance, Containment inheritance, Subclasses constructors, Multilevel, Hierarchical Inheritance, Abstract classes, Defining and Implementation of Interfaces, Interfaces and Inheritences, Overloading unary and binary operators.

Delegates and events, exceptions, multiple catches, finally statement, throwing and own exception.

Reference:-

1. E. Balguru swami, "Programming in C# :", TMH.
2. Shibi Panikkar and Kumar Sangeev, "Magic of C# with .NET FrameWork", Laxmi Publication
3. Dev Prakash, "Understanding C#", Gbe Tech Publications.

MIT-410P**PROGRAMMING USING C#**

Maximum Time	: 3 Hrs.	University Examination	: 35
Total Marks	: 50	Continuous Internal Assessment	: 15
Minimum Pass Marks	: 40%		

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MIT-410

MIT-420**NUMERICAL METHODS**

Maximum Time	: 3 Hrs.	University Examination	: 70
Total Marks	: 100	Continuous Internal Assessment	: 30
Minimum Pass Marks	: 40%		

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Errors: definitions, Sources, examples, propagation of errors, summation
Solution methods, secant method, Newton-Raphson method, fixed Point iteration, methods for finding complex roots.

SECTION B

Interpolation: Polynomial interpolation, Newton-: Gregory Forward differences interpolation; Newton- Gregory Backward differences interpolation; Central differences interpolation, Stirling's Bessel's divided differences interpolation formula' inverse interpolation- Lagrange's method and method of successive approximations.
Matrices and Linear System of equations and computing matrix inverse, Symmetric positive definite matrices and least square approximation. Gauss-elimination and Gauss-Jordan methods; Gauss-seidel iterative method.

SECTION C

Numerical differentiation and integration; Numerical differentiation and errors in Numerical differentiation. Numerical; Newton-cotes formulae, Trapezoidal rule, Simpson's 1/3rd and 3/8th rule, Gaussian integration.
Numerical solutions of ordinary differential equations' Picard's method; Taylor's series method; Euler's method; Modified Euler's method; Runge-kutta methods; second and fourth order RK method; Predictor-corrector' method, Milne-Simpson's method, Adams-Bashford method, Adams Moulton method

Reference:-

1. M.K. Jain, S.R.K Iyenger, R.K. Jain, "Numerical Method for Scientific & Engineering Computation", New Age International.
2. S. S. Shastri, "Introductory Methods of Numerical Analysis", PHI.

Maximum Time : 3 Hrs. University Examination : 70
Total Marks : 100 Continuous Internal Assessment : 30
Minimum Pass Marks : 40%

A) Instructions for paper-setters

The question paper will consist of 4 sections A, B, C, D. Sections A, B, C will have 2 questions from the respective sections of the syllabi and will carry 20% marks each. Section D will have 10-15 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

The students shall need to answer one question each from sections A, B, C of the paper. They shall have to answer the entire section D.

SECTION A

Complexity & Recurrences :- Space complexity, Time complexity, Asymptotic notation ($\Omega, \theta, O, \omega, \circ$), Solution of recurrence relations : recursion tree method, master method, Iteration method.

Divide & Conquer : General method, Binary search (Iterative & recursive), Merge sort, Quick sort, Selection, Strassen's matrix multiplication.

SECTION B

Greedy method :- General method, Fractional knapsack, Job sequencing with deadline, Prim's algorithm, Kruskal's algorithm, Dynamic Programming: General method, All pair shortest path, 0/1 Knapsack problem, Traveling salesman problem, Longest common subsequence, Matrix chain multiplication.

SECTION C

Backtracking Method : General method, 8-Queen's problem, Sum of subset, Graph coloring, Knapsack problem, Branch and Bound, LIFO search, FIFO search, LC search, 0/1 Knapsack, Traveling salesman problem, Comparison Trees : Ordered searching, sorting, selection, oracles and adversary arguments : Merging, Longest & Second longest selection.

Lower bound through reduction : Disjoint set on-line medium, Multiplying triangular matrices.

Reference:-

1. Horowitz Sahni Rajasekaran, "Fundamentals of computer Algorithms", Galgotia.
2. LipSchutz, "Theory and problems of Data Structures"(Schaum's outline series), TMH.

Maximum Time : 3 Hrs.

University Examination : 140

Total Marks : 200

Continuous Internal Assessment : 60

Minimum Pass Marks : 40%

1. Students are supposed to spend 45-55 hours on the project. The internal teacher must monitor progress of the Project. Students can arrange the project at their own level, however, Institute can also assist in getting the project. Students can arrange the project at their own level, however, Institute can also assist in getting the project and can issue necessary letters etc.
2. The external examiner will distribute marks allocated for University examination for viva/project report and for any other activity, which the external examiner thinks to be proper.

Maximum Marks for Project Application	60%
Max marks for Viva	40%
3. Joint projects will be allowed and joint project reports will also be accepted. The students should highlight their contributions in a joint project report.
4. The students have to submit two copies of Project reports. The examiners will evaluate these reports on the spot at the time of examination and will conduct the viva.