# ASIAN EDUCATIONAL INSTITUTE, PATIALA

## (An Autonomous Body)

## School of Computer Science

KNOWLEDGE IS POWER

ASIAN

GROUP OF COLLEGES

ESTD. 2010

SCHEME OF EXAMINATION FOR POST-GRADUATE PROGRAMME

## MASTER OF SCIENCE IN INFORMATION TECHNOLOGY (M Sc.-IT)
## (Programme Code MIMT2AS)

## CHOICE BASED CREDIT SYSTEM (CBCS)

## (SEMESTER 1st AND 2nd)

## SESSION 2024 -2025

# ORDINANCES FOR MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

**Applicability of Ordinances for the time being in force.**

**Notwithstanding the integrated nature of a course spread over more than one academic year, the Ordinances in force at the time a student joins a course shall hold good only for the examination held during or at the end of the academic year.**

**Nothing in these Ordinances shall be deemed to debar the College from amending the ordinances subsequently and the amended ordinances, if any, shall apply to all the students whether old or new.**

1. **The examination for the degree of Master of Science shall be held in two parts to be called MSc.IT Part I and MSc.IT Part II.**
2. **Each part shall consist of two semesters i.e. Semester-I & Semester-II in Part I, and Semester-III & Semester-IV in Part II.**
3. **The Examination shall be held in the months November/December (for semester I &III) and April/May (for semester II & IV) or on such other dates as may be fixed by the Institute.**

**Candidate belonging to the following categories shall be allowed relaxation of 5% in the aggregate percentage:**

**(a) Scheduled Castes and Scheduled Tribes.**

**(b) Physically handicapped, provided that they produce a medical certificate that they have at least 40% physical disability.**

**4. MSc.IT Part II shall be open to any person who has passed MSc.IT Part- I examination or has cleared at least 50% of total papers prescribed for first and second semesters of MSc.IT courses. In case, the result of 2nd semester is not declared at the time of admission to 3rd semester, the student may be admitted provisionally and will be allowed to take the examination of 3rd semester if he/she has passed 50% of the total papers of first year (i.e. 1st and 2nd semester).**

**5 .A Candidate must complete and pass the whole course of two years within a maximum of four years from the date of admission in MSc.IT First semester. If the candidate does not clear the lower examination within stipulated period the higher result of the candidate will stand automatically cancelled.**

**6. Semester examinations will be open to regular candidates who have been on the rolls of the college and meet the attendance and other requirements as prescribed in the ordinances of the course.**

7. Examination Rules :-

I. Paper Setting/Evaluation will be done by an External Examiner or as decided by the Examination Cell.

II. The medium of examination for subjects in the MSc.IT shall be English.

III. The supplementary examination will be held along with the routine End Semester Tests. The supplementary paper would be from the syllabi prescribed for that session in which the candidate is appearing.

IV. The student can appear only in the theory paper on the payment of the required fee. The candidate will have consecutive two attempts to clear the Supplementary Examination, marks of practical and internal assessment will be carry forward as original.

V. The students who have reappear in 3rd semester only in Two Year Degree Course respectively at the Postgraduate Level will be allowed to appear in their Reappear examination along with the Final Semester Examinations of their respective courses.

VI. The Principal can provide Golden Chance (with special chance fee) to students who have been unable to clear their exams even after two attempts.

VII. A Candidate placed under reappear in any paper, will be allowed two chances to clear the reappear, which should be availed within consecutive two year/chances i.e. to pass in a paper the candidate will have a total of three chances, one as regular student and two as reappear candidate.

VIII. The examination of reappear papers of odd semester will be held with regular examination of the odd semester and reappear examination in even semester with the even semester. But if a candidate is placed under reappear in the last semester of the course, he/she will be provided chance to pass the reappear with the examination of the next semester, provided his/her reappear of lower semester does not go beyond next semester.

IMPROVEMENT EXAMINATIONS:

I. A student who has been declared 'pass' in the Postgraduate course he/she was admitted to, may apply for improvement examination within a year from the declaration of the result of the final semester and he/she can take maximum of 50% of the total papers for that course for improvement.

II. A student shall have to appear in End semester examination of the paper chosen for improvement along with the regular students. No special exam shall be held for him/her.

III. If a student fails to improve upon the original marks obtained in the paper chosen for improvement, his/her original marks shall be retained and he/she shall not get a second chance for improvement.

IV. Improvement examination in Practical/MST paper shall not be allowed. A student taking improvement examination shall have to pay a fee decided by the college.

## Grading System:

**The grades and their description, along with equivalent numerical grade points are listed in the Grading Assignment Table as follows:**

| Percentage of Marks | Description | Grade | Grade Point |
|---|---|---|---|
| **91-100** | OUTSTANDING | O | 10 |
| **81-91** | EXCELLENT | A+ | 9 |
| **71-80** | VERY GOOD | A | 8 |
| **61-70** | GOOD | B+ | 7 |
| **51-60** | ABOVE AVERAGE | B | 6 |
| **41-50** | AVERAGE | C | 5 |
| **35-40** | PASS/FAIR | D | 4 |
| **0-34** | FAIL | F | 0 |
| **Otherwise** | ABSENT DETAINED | AB/D | 0 |
| | | | |

a. A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.

b. For non credit courses **'Satisfactory'** or **'Unsatisfactory'** shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA.

**Computation of SGPA and CGPA**

The UGC recommends the following procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

Computation of SGPA and CGPA .The UGC recommends the following procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

a) The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student , i. e
b) SGPA (Si) =∑ ( )/∑Earned Credits Ci; Where Ci is the number of credits of the it course and Gi is the Grade Point Scored by the student in the course.
c) The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all these mesters of a programme ,i.e. CGPA(Ci)=∑(Earned Credits C ix SGPA Si)/∑Ci); Where Si is the SGPA of the ith semesters and Ci is the total number of credits in that semester.
d) The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

**Illustration of the computation of SGPA and CGPA and Format for Transcripts.**

**Computation of SGPA and CGPA**

**Illustration for SGPA**

| Course | Credits | Grade Letter | Grade Point | Credit Point (CreditxGrade) |
|---|---|---|---|---|
| Course 1 | 3 | A | 8 | 3X8= 24 |
| Course 2 | 4 | B+ | 7 | 4X7= 28 |
| Course 3 | 3 | B | 6 | 3X6= 18 |
| Course 4 | 3 | O | 10 | 3X10= 30 |
| Course 5 | 3 | C | 15 | 3X5= 15 |
| Course 6 | 4 | B | 6 | 4X6= 24 |

Thus, **SGPA=139/20=6.95**

| SEMESTER I | SEMESTER II | SEMESTER III | SEMESTER IV |
|---|---|---|---|
| Credit:20<br>SGPA:6.9 | Credit:20<br>SGPA:6.9 | Credit:20<br>SGPA:6.9 | Credit:20<br>SGPA:6.9 |

**Thus, CGPA=$\frac{20x6.9+20x6.9+20x6.9+20x6.9}{80}$= 6.9**

**Transcripts (Format): Based on the above recommendations on Letter grades, grade points, SGPA and CGPA, the College may issue the transcript for each semester and a consolidated transcript indicating the performance in all semesters.**

***Division and Position:***

**Division shall be awarded in the following manner , to the candidates on the basis of their respective CGPA:**

| | |
|---|---|
| CGPA7.5 or more | 1st DivisionwithDistinction |
| CGPA 6.0 or more but less than 7.5 | 1st Division |
| CGPA 5.0 or more but less than 6.0 | 2nd Division |
| CGPA 3.5 or more but less than 5.0 | 3rd Division |
| Otherwise | Fail |

**However, First, Second or Third position shall be awarded to the candidates, provided they meet the following conditions:**

a) **Rank shall be solely decided on the final CGPA, on completion of degree credit requirement.**
b) **The candidate has completed all the prescribed requirements, in the prescribed programme duration.**
c) **The candidate has passed/secured valid grades in all the prescribed courses, in the first attempt.**
d) **No disciplinary action is pending or has ever been lodged against him/her.**

e) In case of an exceptional tie, both candidates shall be awarded the same rank.

## MALPRACTICES/UNFAIR MEANS

The following shall be deemed to be unfair means:

I. Leaving the Examination Hall without submitting the answer book to the invigilator or taking away, tearing off or otherwise disposing off the same or any part thereof.

II. Using abusive language in the examination hall or writing the same in the answer sheet. Making an appeal to the evaluator through answer sheet.

III. Possession by examinee or having access to books, notes, papers, mobile or any other electronic material which can prove to be helpful in the exam.

IV. Any action on the part of candidate at an examination trying to get undue advantage in the performance at examinations or trying to help another, or derive the same.

V. Impersonating for a candidate in the examination. Intimidating, threatening, manhandling, using violence, show of force in any form against any invigilator or any person on duty, creating disturbance to the smooth conduct of the examination.

VI. Any other action which the Controller Examination / Chief Controller deem fit to be a case of UMC

In case the student is found to have used any of the above Unfair means:

I. His/her answer book shall be seized and He/She will be given a new answer sheet.

II. Invigilator shall submit a detailed report along with the answer book of the student and the related material, if any, to the Centre Superintendent who will subsequently hand it over to Controller Examination.

III. Written statement to this effect shall be obtained from the student by the Centre Superintendent. In case the student refuses to do the same, the fact of refusal must be recorded.

IV. The student reported to have used unfair means shall be allowed to appear in the subsequent papers. However, no marks would be awarded for the paper in which unfair means were used.

V. The Principal shall refer the cases of malpractices in Mid Semester tests, House Tests and End Semester Examinations, to an Unfair Means Committee, constituted by him/her for the purpose. Such committee shall follow the approved scales of punishment.

VI. The Principal shall take necessary action, against the erring students based on the recommendations of the committee.

The involvement of the Staff, who are in charge of conducting examinations, evaluating examination papers and preparing/keeping records of documents relating to the examinations if involved in such acts (inclusive of providing incorrect or misleading information) that infringe upon the course of natural justice to one and all concerned at the examination shall be viewed seriously and recommended for award of appropriate punishment after enquiry

**Attendance Regulations & Condonation:**

1. **A student shall be eligible to appear for end semester examinations, if he/she acquires a minimum of 75% of attendance in each subject.**
2. **Request to the Principal for Condonation of shortage of attendance after the recommendation of the HOD will be forwarded to Lecture Shortage Condonation Committee.**
3. **The committee can finally condone the shortage in aggregate up to 15% on medical grounds in each semester.**
4. **Any student representing the Institute/ University/ State/ Nation in any Academic/ Sports/ Cultural/Extra Co curricular/ NSS/NCC or any other event shall be considered on duty.**
5. **His/ Her shortage of lectures shall be condoned, provided that the student is permitted in writing by the Principal/HOD concerned and a certificate to this effect signed by the competent authority where the student attended the event is taken.**
6. **A Student will not be promoted to the next semester unless he/she satisfies the attendance requirement of the present semester as applicable.**
7. **Students whose shortage of attendance is not condoned in any semester are not eligible to take their end semester examination of that particular semester and their registration for examination shall stand cancelled and no fee shall be refunded.**

***Late college students:***

**A candidate, who has completed the prescribed course of instructions for a semester but has not appeared in the examination or having appeared, has failed in the examination, may appear as a late college student within the prescribed period.**
**Applications for admission to the examination shall be made on the prescribed form attested by the competent authority as per the college rules.**
**Amount of examination fee to be paid by a candidate for each semester shall be as fixed by the College from time to time.**

**The syllabus for the session shall be such as prescribed by the institute from time to time. Viva Voce/ Practical examination shall be conducted by a Committee consisting of the following:**
**One External examiner**
**One Internal Examiner**

**Assessment:**

**MSc. IT Course is Credit Based Semester System (CBSS) as described in the Introduction. The Assessment in all semesters of MSc. IT Course will be 30% internal and 70% external for each paper. The result of the Internal Assessment shall be conveyed to the students/examination branch by the Head of the Department as per approved schedule.**

**There shall be Two Mid Semester tests in each Semester.**
**Internal Assessment of 30% will be based on Continues Comprehensive Assessment (CCA)**

Paper Evaluator Head of the Department Controller of Examination A candidate is required to secure at least 35% marks both in external examination (Theory and Practical/ Project work) and in internal assessment separately in each paper in order to qualify in an examination.

Students should be shown the internal assessment before submission. In case the student is dissatisfied with the marks awarded to him/her in internal assessment; he/she can approach the concerned teacher. If the student is still not satisfied he/she may approach the head of department and the Principal subsequently. In case such a paper is dropped from the course of study as a result of any revision the department would indicate a suitable substitute paper in lieu thereof.

**End-Semester Examination:**

- End-semester examination(s) of each theory course shall be of three hours duration and will be conducted as per norms and schedule notified by the Controller of Examination.
- The end semester examinations of laboratory/practical courses and other courses such as seminar, colloquium, field work, project, dissertation etc. shall be conducted as notified by the HOD.

**Degree Requirement:**

The result of all the examinations will be declared through the College website. The grace marks shall be allowed according to the general ordinances relating to 'Award of Grace Marks'

These ordinances will apply to all examinations.

(i) Up to 1% of the total marks of Part-I and II examination shall be added to the aggregate of both Part-I and Part-II examinations to award a higher division/55%marks, to a candidate.

(ii) Grace marks to be given shall be calculated on the basis of 1% of total aggregate marks of all the written and practical papers of the examination concerned. Marks for viva-voice/internal assessment/sessional work/skill in teaching/any additional /optional / deficient subject shall not be taken into account for this purpose. If a fraction works out to half or more, it shall count as one mark and fractional less than half shall be ignored

(iii) To pass in one or more written papers or subjects, and/or to make up the aggregate to pass the examination but not in sessional work, internal assessment, viva-voice and skill in teaching.

- The College may from time to time revise, amend and change the regulations or the curriculum, if found necessary.

- A student who earns total specified credits according to the curriculum and fulfils such other conditions as may be mentioned in the curriculum of the programme shall be issued the DMC and shall APPROVED

Chairperson Board of Studies are of Studies x be awarded degree by Punjabi University Patiala.

- He/she must also pay all College dues as per rules. Moreover, there should be no case of indiscipline pending against him/her.
- If any student gets admission after concealing any fact or his/her certificates are found fake after verification or he/she misleads the institution as any front or because of any other reason, his/her admission will stand cancelled though he/she may have been declared pass.
- In case the ordinance is silent about any issue, it will be decided by the College Principal in consultation with the Academic Advisory Committee of the college in the anticipation of approval of the same by Academic Council of the College.

## PROGRAM OUTCOMES (POs)

**1. Computational Knowledge:** Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

**2. Problem Analysis:** Identify, formulate, research literature, and solve computing problem searching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.

**3. Design /Development of Solutions:** Design and evaluate solutions for computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

**4. Conduct investigations of Computing problems:** User research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

**5. Modern Tool Usage:** Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to computing activities, with an understanding of the limitations.

**6. Professional Ethics:** Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.

**7. Life-long Learning:** Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.

**8. Communication Efficacy:** Communicate effectively with the computing community and with society at large, about computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

**9. Societal and Environmental Concern:** Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.

**10. Individual and Team Work:** Function effectively as an individual and as Am member or leader in diverse teams and in multidisciplinary environments.

# SYLLABI, OULINES OF PAPERS AND TESTS
## M.Sc. (IT) Semester-I
## (Programme Code MITM2AS)
## (Session 2024-25)

| Code No. | Title of the Paper | Credit | Hours per week | Ext. Exam. Marks | Int. Ass. Marks | Max Marks | Total Time Allowed |
|---|---|---|---|---|---|---|---|
| MITM1101T | Introduction to Information Technology and E-Commerce | 4 | 4 | 70 | 30 | 100 | 3 Hrs |
| MITM1102T | Problem Solving Using Computers | 4 | 4 | 70 | 30 | 100 | 3 Hrs |
| MITM1103T | Web Technology | 4 | 4 | 70 | 30 | 100 | 3 Hrs |
| MITM1104T | Mathematical Foundation of Computer Science | 4 | 4 | 70 | 30 | 100 | 3 Hrs |
| MITM1105L | Programming Lab-I (Based on MITM1102T) | 2 | 4 | 70 | 30 | 100 | 3 Hrs |
| ITM1106L | Programming Lab-II (Based on MITM1103T) | 2 | 4 | 70 | 30 | 100 | 3 Hrs |
| | Total | 20 | | 420 | 180 | 600 | |

## CONTINUOUS ASSESSMENT (THEORY PAPERS)

| | | | |
|---|---|---|---|
| 1. | Two tests will be conducted during the Semester. One best will be considered for assessment. | : | 60% of the marks allotted for Continuous Assessment |
| 2. | Assessment/Quizes | : | 20% of the marks allotted for Continuous Assessment |
| 3. | Attendance | : | 10% of the marks allotted for Continuous Assessment. |
| 4. | Class Participation and behavior | : | 10% of the marks allotted for Continuous Assessment. |

**MITM1101T: INTRODUCTION TO INFORMATION TECHNOLOGY AND E-COMMERCE**

**Maximum Time: 3 Hrs.**
**Minimum Pass Marks: 35%**
**Lectures to be delivered: 45-55 Hrs.**

**Total Marks: 100**
**External Examination: 70**
**Internal Assessment: 30**

**A) Instructions for paper-setter**

The question paper will consist of three sections A, B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 30% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

**B) Instructions for candidates**

1. Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.
2. Use of non-programmable scientific calculators is allowed.

**COURSE OUTCOME:**

- Aware students about the basics of computers and its evolution.
- Provide knowledge of different units of computer like processing unit, IO unit, and storage unit.
- Applications of Computers.
- Advanced trends in IT.

**SECTION-A**

**Computer Fundamentals:** Block structure of a computer, characteristics of computers, problem solving with computer, Classification of Computers on the basis of capacity, purpose and generations.
**Input and Output Units:** Functional Characteristics of Graphical I/O devices: Mouse, Joy tick, Touch Screen, Light Pen, Optical Recognition devices – MICR, OMR, OBR, OCR. Printers: Impact and Non Impact Printers.
**Memory Types:** Magnetic core, RAM, ROM, Cache memory, Secondary.
**Overview of Storage Devices** – Magnetic tape, Floppy Disk, Hard Disk, Optical Storage.
**Computer Languages and Software:** Types of Software- System Software, Application Software, Firmware. Computer Languages: Machine language, assembly language, high level language, 4GL, Compiler, Interpreter and Assembler.

**SECTION-B**

**Computer Codes:** weighted and non-weighted code, BCD, EBCDIC, ASCII, Unicode.
**Computer Network and Data Communication:** Network types, Network topologies, Transmission modes.
Internet Concepts: Evolution of Internet, World Wide Web, Uniform Resource Locator, Web Browsers, FTP, Hyperlink, HTTP, Video Conferencing, GPS, 3G, 4G, Wi-Fi, Bluetooth, Cloud Technology.

**E-Commerce:** The Scope of E-Commerce, Electronic Market, Electronic Data Interchange, Internet Commerce, Benefits and Limitations of E-Commerce, Produce a generic framework for E-Commerce, Architectural framework of E-Commerce. Web based E-Commerce Architecture.

**Text/Reference Books:**


1. Peter Nortorn, Introduction to Computers, SeventhEdition
2. V. Rajaraman, Fundamentals of Computers, PHI.
3. Larry E. Long and Nancy Long, Computers: Information Technology in Perspective, PHI.
4. N. Subramanian, Introduction to Computers, Tata McGraw-Hill.
5. D.H. Sanders, Computers Today, McGraw- Hill.

## MITM1102T: PROBLEM SOLVING USING COMPUTERS

**Maximum Time: 3 Hrs.**
**Minimum Pass Marks: 35%**
**Lectures to be delivered: 45-55 Hrs.**

**Total Marks: 100**
**External Examination: 70**
**Internal Assessment: 30**

### A) Instructions for paper-setter

The question paper will consist of three sections A, B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 30% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

### B) Instructions for candidates

1. Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.
2. Use of non-programmable scientific calculators is allowed.

### COURSE OUTCOME:

This course is designed to explore computing and to show students the art of computer programming. Students will be able to learn Understanding programming using C concepts for writing good programs. On completion of this course, the students will be able to

- Write, compile and debug programs in C language.
- Use different data types, operators and console I/O functions in a computer program.
- Design programs involving decision control statements, loop control statements and case control structures.
- Understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of pointers.

### SECTION A

**Problem solving process/Logic development**: Problem definition, Algorithm development, Flowchart, Pseudo code, Coding, Compilation and debugging.
**Basic structure of C program:** History of C, Structure of a C program, Character set, Identifiers and keywords, constants, variables, data types.
**Operators and expressions:** Arithmetic, Unary, Logical, Relational operators, assignment operators, Conditional operators, Hierarchy of operations type conversion.
**Control statements:** branching statements (if, if else, switch), loop statements (for, while and do-while), jump statements (break, continue, goto), nested control structures.
**Functions:** Library functions and user defined functions, prototype, definition and call, formal and actual arguments, local and global variables, methods of parameter passing to functions, recursion. I/O functions: formatted & unformatted console I/O functions.

### SECTION B

**Storage Classes:** automatic, external, static and register variables.
**Arrays:** One-dimensional and two-dimensional arrays, Declaration, initialization, reading values into an array, displaying array contents
**Strings:** input/output of strings, string handling functions (strlen, strcpy, strcmp, strcat strrev), table of strings.

**Structures and unions:** using structures and unions, comparison of structure with arrays and union.
**Pointers:** pointer data type, pointer declaration, initialization, accessing values using pointers, pointers and arrays.
**Introduction to Files in C:** opening and closing files. Basic I/O operation on files.

**Text/Reference Books:**


1. E. Balagurusamy, Programming in C, Tata McGraw-Hill.
2. Kernighan and Ritchie, The C Programming Language, PHI.
3. Byron Gotfried, Programming in C.
4. Kamathane, Programming in C, Oxford University Press.

**MITM1103T: WEB TECHNOLOGY**

**Maximum Time: 3 Hrs.**
**Minimum Pass Marks: 35**
**Lectures to be delivered: 45-55 Hrs.**

**Total Marks: 100**
**External Examination: 70**
**Internal Assessment: 30**

**A) Instructions for paper-setter**

The question paper will consist of three sections A, B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 30% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

**B) Instructions for candidates**

1. Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.

2. Use of non-programmable scientific calculators is allowed.

**COURSE OUTCOME:**

This course is designed to explore the features of web technology and its significance in developing web-based applications. Students will be able to learn and understand the concepts of web programming. On completion of this course, the students will be able to

- Understand the basics of HTML for creation of web pages
- Create forms for interactive applications
- Integrate HTML and CSS
- Understand the design of applets

**SECTION-A**

**Internet Basics:** Networks, Protocols, TCP/IP, Internet Addresses, Ports, Sockets, Name Resolution, Firewalls, Protocol Tunnelling, Proxy Servers, Internet Standards, MIME, Overview of clients/servers web communication, comparison of web servers, Common Gateway Interface CGI.

**World Wide Web (WWW):** World Wide Web and its evolution, web page, web server, HTTP/HTTPS protocol. Examples of web servers. Navigation Tools: Mozilla Firefox, Google Chrome, Internet Explorer, Uniform Resource Locator (URL). Hypertext, hyperlinks and hypermedia, URL, its registration, browsers, search engines, proxy servers.

**Developing Web Portals Using HTML:** Basic structure of HTML, Formatting text, title, headings, Horizontal rules and comments, Inserting links and images, Creating tables, Creating forms and frames

**SECTION-B**

**PHP:** Introduction, syntax, variables, statements, operators, decision making, loops, arrays, strings, forms, get and post methods, functions, Introduction to cookies, storage of cookies at client side, Using information of cookies, Creating single or multiple server side sessions, Timeout in sessions, Event management in PHP, introduction to content management systems based on PHP

**PHP and MySQL:** Introduction to MySQL, connecting to MySQL database, creation, insertion, deletion and retrieval of MySQL data using PHP, Introduction of new databases.

**Text/Reference Books:**


1. Jeffrey C Jackson, "Web Technology — A computer Science perspective", Pearson Education, 2007.
2. Chris Bates, "Web Programming — Building Internet Applications, "Wiley India, 2006.
3. Xavier, C, " Web Technology and Design" , New Age International
4. Ivan Bayross," HTML. DHTML, Java Script. Perl & CGI", BPB Publication.
5. Ramesh Bangia, "internet and Web Design" , New Age International
6. Bhave, "Programming with Java", Pearson Education
7. Ullman, "PHP for the Web: Visual QuickStart Guide", Pearson Education
8. Deitel, "Java for programmers", Pearson Education
9. Dustin R. Callaway, "Inside Servlets" Pearson Education.

## MITM1104T: MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

**Total Marks: 100**
**External Examination: 70**
**Internal Assessment: 30**

**Maximum Time: 3 Hrs.**
**Minimum Pass Marks: 35%**
**Lectures to be delivered: 45-55 Hrs.**

### A) Instructions for paper-setter

The question paper will consist of three sections A, B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 30% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

### B) Instructions for candidates

1. Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.

2. Use of non-programmable scientific calculators is allowed.

### COURSE OUTCOME:

The purpose of this course is to provide a clear understanding of the concepts underlying fundamental concepts and tools in discrete mathematics with emphasis on their applications to computer science. It emphasizes mathematical definitions and proofs as well as applicable methods.
On completion of this course, the students will be able to

- Be familiar with the basic terminology of functions, relations, and sets and demonstrate knowledge of their associated operations.
- Master to solve advanced mathematical problems, apply various methods of mathematical proof, and communicate solutions in writing.
- Master to comprehend advanced mathematics, and present the material orally and in writing.
- Utilize the knowledge of computing and mathematics appropriate to the discipline.
- Evaluate mathematical principles and logic design.

### SECTION-A

**Logic:** Propositions, Implications, Precedence of Logical Operators, translating English Sentences, System Specifications. Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Order of Quantifiers, Sets, Power Set, Set Operations, Functions, One-to-One Functions and Onto Functions, Inverse and Composition of Functions, Floor Function, Ceiling Function.

Algorithms, Searching Algorithms, Sorting, Growth of Functions, Big-O Notation, Big-Omega and Big-Theta Notation, Complexity of Algorithms, Mathematical Induction, The Basics of Counting, The Pigeonhole Principle.

### SECTION-B

Recurrence Relations, solving recurrence relations, Divide and Conquer Algorithms and Recurrence Relations, Generating functions for sorting recurrence relations, Inclusion-Exclusion.
Relations and their properties, n-any relations and their applications, representing relations, closure of relation, equivalence relations, partial ordering.

**Graphs:** Introduction, terminology, Representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamiltonian Paths, Shortest Path Problems, Planar Graphs.

**Text/Reference Books:**


1. Rosen, K.H: Discrete Mathematics and Its Applications, TMH Publications.
2. Discrete and Combinatorial Mathematics, Ralph P. Grimaldi, Pearson Education.
3. Elements of Discrete Mathematics, C. L. Luie, TMH Publications.
4. Discrete Mathematics, Richard Johnson, Baugh, Pearson Education.
5. Discrete Mathematical Structures with Applications to Computer Science, J. P. Tremblay & R. P. Manohar, MGH Publications.
6. Discrete Mathematical Structures, B.Kotman, R.C. Busbay, S.Ross, PHI.

**MITM1105L: PROGRAMMING LAB-I**

**Maximum Marks: 100***
**Minimum Pass Marks: 35%**

**Max. Time: 3 Hrs.**
**Practical sessions to be conducted: 60-70**

This laboratory course will mainly consist of exercise based on the subject MITM1102T (Problem solving using computers).

*Maximum Marks for Continuous Assessment: 30

Maximum Marks for External Examination: 70

**MITM1106L: PROGRAMMING LAB-II**

**Maximum Marks: 100**
**Minimum Pass Marks: 35%**

**Max. Time: 3 Hrs.**
**Practical sessions to be conducted: 60-70**

This laboratory course will mainly consist of exercise based on the subject MITM1103T (Web Technology).

Maximum Marks for Continuous Assessment: 30

Maximum Marks for External Examination: 70

# SYLLABI, OULINES OF PAPERS AND TESTS
## M.Sc. (IT) Semester-II
## (Programme Code MITM2AS)
## (Session 2024-25)

| Code No. | Title of the Paper | Credit | Hours per week | Ext. Exam. Marks | Int. Ass. Marks | Max Marks | Total Time Allowed |
|---|---|---|---|---|---|---|---|
| MITM1201T | Desktop Publishing | 4 | 4 | 70 | 30 | 100 | 3 Hrs |
| MITM1202T | Programming with Python | 4 | 4 | 70 | 30 | 100 | 3 Hrs |
| MITM1203T | Operating System | 4 | 4 | 70 | 30 | 100 | 3 Hrs |
| MITM1204T | Computer Organisation and Architecture | 4 | 4 | 70 | 30 | 100 | 3 Hrs |
| MITM1205L | Programming Lab-III (Based on MITM1201T) | 2 | 4 | 70 | 30 | 100 | 3 Hrs |
| MITM1206L | Programming Lab-IV (Based on MITM1202T) | 2 | 4 | 70 | 30 | 100 | 3 Hrs |
| | Total | 20 | | 420 | 180 | 600 | |

## CONTINUOUS ASSFSSMENT (THEORY PAPERS)

| | | | |
|---|---|---|---|
| 1. | Two tests will be conducted during the Semester. One best will be considered for assessment. | : | 60% of the marks allotted for Continuous Assessment |
| 2. | Assessment/Quizes | : | 20% of the marks allotted for Continuous Assessment |
| 3. | Attendance | : | 10% of the marks allotted for Continuous Assessment. |
| 4. | Class Participation and behavior | : | 10% of the marks allotted for Continuous Assessment. |

## MITM1201T: DESKTOP PUBLISHING (DTP)

**Total Marks: 100**
**External Examination: 70**
**Internal Assessment: 30**

**Maximum Time: 3 Hrs.**
**Minimum Pass Marks: 35%**
**Lectures to be delivered: 45-55 Hrs.**

### A) Instructions for paper-setter

The question paper will consist of three sections A, B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 30% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

### B) Instructions for candidates

1. Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.
2. Use of non-programmable scientific calculators is allowed.

### COURSE OUTCOME:

- This course will enable the students to familiarize with the features and use of application packages such as Adobe Photoshop, Corel Draw or any other equivalent latest package(s).
- They will develop skills in handling the software. Adobe Photoshop will help the students in understanding technical aspects of multimedia content creation, the processes and tools used for designing multimedia systems.
- This will make the students proficient in designing and developing a multimedia application.

### SECTION-A

**Introduction:** Overview of Desktop Publishing (DTP)
**Photoshop and Animation Technology:** Photo-shop workshop, image editing tools, specifying and adjusting colours, using gradient tools, selection and move tools, transforming path drawing and editing tools, using channels, layers, filters and actions
**Animation Technology:** Definition, History of Animation, Types of animation- 2D and 3D, Basic principles of animation, Various Terms-Animation Drawings/Cels, Rough Drawings, Clean ups, Colour reference drawings, Layout, Model Sheet, Key Drawings and in Between, Master Background, Concept Piece, Character drawing, Story Board.

### SECTION-B

**Corel Draw/Inkscape:** Introduction, exploring Corel Draw screen, using dialog boxes, using roll ups, create/open file, save file, import/export files, print file,Use of ribbon bar, use of tool box, select object, shaping objects using zoom tool, filling objects, outline objects, use of line tool
Setting up new drawing, setting multi-page document, undo/redo mistakes, repeat, cut, copy, paste, delete, duplicate, clone
Insert object, paste special, copy attributes from select all, drawing objects, selecting objects
Page setup, insert/delete page, use of layers, roll up, grid and scale set up, guideline set up
**Formatting objects:** Arranging objects: align, order, group, ungroup
Arranging objects: combine, break apart, weld, intersection, trim, separate Mode edit: to line, to curve, stretch, rotate, align, convert to curves
Creating special effects: Transform roll up, clear transformation, add perspective, envelope roll up

Creating special effects: blend roll-up, extrude roll up, counter roll up, power line, power-clip clear effects

Working with text: Character, paragraph text, frame, setting of tabs, indents, bullets, spacing in paragraph text.

**Text/Reference Books:**


1. Learning Desktop Publishing by Ramesh Bangia; Khanna Book Publishing Co. Pvt. Ltd., New Delhi
2. Desktop Publishing from A to Z by Bill Grout and Osborne; McGraw Hill
3. DTP (Desktop Publishing) for PC users by Houghton; Galgotia Publishing House Pvt. Ltd., Daryaganj, New Delhi.

## MITM1202T: PROGRAMMING WITH PYTHON

**Total Marks: 100**
**External Examination: 70**
**Internal Assessment: 30**

**Maximum Time: 3 Hrs.**
**Minimum Pass Marks: 35%**
**Lectures to be delivered: 45-55 Hrs.**

### A) Instructions for paper-setter

The question paper will consist of three sections A, B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 30% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

### B) Instructions for candidates

1. Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.

2. Use of non-programmable scientific calculators is allowed.

### COURSE OUTCOME:

This course is designed to explore computing and to show students the art of computer programming. Students will be able to learn and Understand programming using python concepts for writing good programs. On completion of this course, the students will be able to

- Understand the basics of Python programming language
- Use different data types and control structures
- Explore the use of Python functions
- Create programs to access files in Python

### SECTION A

**Introduction to Python:** History of Python, Strength and Weakness, Different Versions, Installing Python , Setting up in local environment, IDLE, Executing from file, command line from interactive mode, Python Identifiers and reserved keywords.
**Python syntax:** Variables and Variables type, Data types, Data Types Conversion, Operators (Arithmetic, Comparison, Assignment, Bitwise, Logical, Membership, Identity), Operators Precedence, Python Decision making (if, el if, else, nested if), Python loops (while, for, nested loops), Break and continue statements.
**Python Collections or Sequence:** Sequence introduction, Number operations, String Operations, List, Tuple, Dictionary, Set.
**Python Functions:** Function introduction, User defined functions, Functions with parameters, Keywords and optional parameters, Scope of variables (Global and Local), Anonymous function — Lambda, In-build function, List comprehension.

### SECTION B

**Python Modules:** Modules, Standard Modules (Sys, Math, Time), Import Statement, from statement, Dir() functions. Python File handling: Sending Output to STDOUT Using the print() Method, Reading Input with the input() Method, Creating File Objects with the open() Method,

Controlling File Access Modes, Working with File Object Attributes, Closing File Objects with the close() Method, Reading and Writing to File Objects with read() and write(), Using File Processing Functions from the OS Module.

**Text/Reference Books:**


1. Paul Gries, Jennifer Campbell, Jason Monto)o, Practical Programming- An Introduction to Computer Science Using Python 3.6, Shroff Publications and Distributors
2. John V Guttag, Introduction to Computation and Programming Using Python", Revised and expanded Edition, MIT Press , 2013
3. Robert Sedgewick, Kevin Wayne, Robert Dondero, —Introduction to Programming in Python: An Inter- disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
4. Timothy A. Budd, Exploring Python, Mc-Graw Hill Education (India) Private Ltd., 2015.
5. Paul Gries, Jennifer Campbell and Jason Montojo, Practical Programming: An Introduction to Computer Science using Python 3, Second edition, Pragmatic Programmers, LLC, 20 13.
6. Rossum, Introduction To Python ,Shroff Publications and Distributors
7. Downey,Think Python 2/ED, Shroff Publications and Distributors
8. Lutz, Learning Python, 5/ED, Shroff Publications and Distributors
9. Campbell ,Practical Programming: An Introduction to Computer Science Using Python, Shroff Publications and Distributors

## MITM1203T: OPERATING SYSTEMS

**Total Marks: 100**
**External Examination: 70**
**Internal Assessment: 30**

**Maximum Time: 3 Hrs.**
**Minimum Pass Marks: 35%**
**Lectures to be delivered: 45-55 Hrs.**

### A) Instructions for paper-setter

The question paper will consist of three sections A, B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 30% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

### B) Instructions for candidates

1. Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.

2. Use of non-programmable scientific calculators is allowed.

### COURSE OUTCOME:

This course is designed to explore the unifying concept of the operating system as a collection of cooperating sequential processes. On completion of this course, the students will be able to

- Learn the mechanisms of OS to handle processes and threads and their communication Use different data types, operators and console I/O function in a computer program.
- Learn the mechanisms involved in memory management in contemporary OS.
- Gain knowledge on distributed operating system concepts that includes architecture, deadlock detection algorithms and agreement protocols.
- Understand different approaches to memory management.
- Understand the structure and organization of the file system

### SECTION A

**Introduction to Operating System:** Definition, Types of Operating system, Operating system components, Operating system services. Process Management: Process concept, Process cs. threads, CPU scheduling criteria, Scheduling algorithms, and Algorithm evaluation Deadlocks: Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, avoidance, detection and recovery. File Management: Files concept, Access methods, directory structure, Allocation methods contiguous, linked and indexed.

### SECTION B

**Memory Management:** Background, logical vs. physical address space, Contiguous memory management schemes using Multi partition memory allocation using fixed number of tasks and variable number of tasks, paging and segmentation.

**Virtual Memory management:** Concept, demand paging and demand segmentation. Mass storage structure: Disk structure, disk scheduling algorithms.
**Protection:** Goals of protection, Access matrix.
**Security:** Security problem, Program threats, system threats, User Authentication, Cryptography.

**Text/Reference Books:**


1. Silberschatz and Galvin, "Operating System Concepts", Addison-Wesley publishing.
2. Nutt Gary, "Operating Systems" Addison Wesley Publication.
3. Hansen, Per Brinch, "Operating System Principles", Prentice-Hall.
4. N. Haberman, "Introduction to Operating System Design", Galgotia Publications.
5. Hansen, Per Brinch, "The Architecture of Concurrent Programs", PHI.
6. Shaw, "Logical Design of Operating System", PHI.

## MITM1204T: COMPUTER ORGANIZATION AND ARCHITECTURE

**Total Marks: 100**
**External Examination: 70**
**Internal Assessment: 30**

**Maximum Time: 3 Hrs.**
**Minimum Pass Marks: 35%**
**Lectures to be delivered: 45-55 Hrs.**

### A) Instructions for paper-setter

The question paper will consist of three sections A, B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 30% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

### B) Instructions for candidates

1. Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.

2. Use of non-programmable scientific calculators is allowed.

### COURSE OUTCOME:

- This course will introduce students to the fundamental concepts underlying modem computer organization and architecture. On completion of this course, the students will be able to understand the basics of computer hardware and how software interacts with computer hardware
- Analyze and evaluate computer performance
- Understand how computers represent and manipulate data
- Understand computer arithmetic and convert between different number systems
- Assemble a simple computer with hardware design including data format, instruction format, instruction set, addressing modes, bus structure, input/output, memory, Arithmetic/Logic unit, control unit, and data, instruction and address flow
- Use Boolean algebra as related to designing computer logic, through simple combinational and sequential logic circuits

### SECTION A

Concepts about bits, bytes and word, Number System: Number conversions, Arithmetic operations, Integer and floating point representation. Character codes (ASCII, EBCDIC, BCD, 8421, Excess-3). Boolean expression - Minimization of Boolean expressions - Minterm - Maxterm - Sum of Products (SOP) - Product of Sums (POS) - Karnaugh map Minimization - Don't care conditions - Quine-McCluskey method of minimization.

Basic Gates, Combinational logic design: half-adder, full-adder, half-subtractor, fullsubtractor, binary parallel adder, Multiplexer/ Demultiplexer, decoder, encoder. Sequential circuits: concept, flip-flops (D, RS, IK, JK-Master-Slave, T),counters (Ripple, Asynchronous,Synchronous, Decade, Mod-5),Instruction codes, Instruction formats, Instruction cycle, Addressing modes.

### SECTION B

Register Transfer Language, Arithmetic, Logic and Shift micro-operations, Arithmetic Logic Shift unit.Control Memory: Design of control unit, Microprogrammed and Hardwired control unit (overview only), Features of RISC and CISC.

Memory organization: Concepts of semiconductor memory, CPU- memory interaction, organization of memory
modules, Cache memory and related mapping and replacement policies. Virtual memory. I/O organization: I/O interface, Modes of data transfer: Programmed I/O, Interrupt initiated I/O,DMA.

**Text/Reference Books:**


1. M.M. Mano, "Computer System Architecture", Prentice-Hall of India.
2. A.S. Tanenbaum, "Structured Computer Organisation", Prentice- Hall of India.
3. William Stallings, "Computer Organization and Architecture", Pearson Education.

**MITM1205L: PROGRAMMING LAB-III**

**Maximum Marks: 100**
**Minimum Pass Marks: 35%**

**Max. Time: 3 Hrs.**
**Practical sessions to be conducted: 60-70**

This laboratory course will mainly consist of exercise based on the subject MITM1201T Desktop Publishing (DTP)

Maximum Marks for Continuous Assessment: 30

Maximum Marks for External Examination: 70

**MITM1206L: PROGRAMMING LAB-IV**

**Maximum Marks: 100**
**Minimum Pass Marks: 35%**

**Max. Time: 3 Hrs.**
**Practical sessions to be conducted: 60-70**

This laboratory course will mainly consist of exercise based on the subject MITM1202T (Programming with Python)

Maximum Marks for Continuous Assessment: 30

Maximum Marks for External Examination: 70