UNIVERSITY OF MUMBAI

CENTRE FOR DISTANCE AND ONLINE EDUCATION (CDOE)

Dr. Shankar Dayal Sharma Bhavan, Vidyanagari, Kalina,
Santacruz (E), Mumbai-400 098.

Providing Higher Education through Distance mode since 1971

55 successful years in Open and Distance Education

Prospectus 2025-26

Visit: http://mu.ac.in/portal/distance-open-learning/ Email: info@idol.mu.ac.in Facebook: idol.uom@groups.facebook.com , Twitter: @idol_uom,

Whatsapp link- https://www.whatsapp.com/channel/0029VaA72qFInlqGaMNqjt40

YouTube channel link: https://youtube.com/@idoluniversityofmumbai

CONTENT

SECTION-ONE

1.1 THE UNIVERSITY OF MUMBAI:

The University of Mumbai (earlier known as University of Bombay) is one of the oldest and premier Universities in India. Established on 18thJuly, 1857, it is one amongst the first three universities in India, other being Calcutta and Madras universities. It is a University with Potential for Excellence Award accorded by the UGC.
The University has been reaccredited with 'A++' with (CGPA 3.65) by NAAC.

In addition UGC has granted **Category I Status** to the **University of Mumbai**.
University of Mumbai has seven campuses along with the headquarter there are six sub campuses (i.e. **Fort campus** (Main Headquarter), **Churchgate, Kalina, Thane, Kalyan, Ratnagiri, and Sawantwadi**). 742 affiliated colleges and 55 departments with an enrolment of more than 7 lakh Students are engaged in the teaching-learning process. It has established its name in industrial collaboration and runs various professional programmes. The university is leading at national level in sports, cultural and other activities.

1.2 THE INSTITUTE:

The university started its correspondence education on 24th March 1971. It was known as "Directorate of Correspondence Programmes." In 1985 it was upgraded as "Directorate of Distance Education" which was further in 1993, upgraded as "Institute of Distance Education" (IDE). In the academic year 2008-09 the "The Institute of Distance and Open Learning" (IDOL) is now as per ODL regulation 2020 it is named as **"CENTRE FOR DISTANCE AND ONLINE EDUCATION**" (CDOE) in February 2024. Since its inception CDOE has been giving high priority to human resource development by introducing various traditional Degree Programmes as well as Technical and Professional Programmes through distance and online mode.

University of Mumbai is the 7th University in the country which has started a Distance Education Program in a conventional set up. Initially it started with the registration of 845 students which has grown up to a staggering figure of 76,495 (2016-2017) in the last academic year. Students are also doing well by topping the merit list of the university examination and have bagged Gold Medal in M.A. Sanskrit, M.A. Marathi and Chancellor's Medal in M.A. Hindi. There are a good number of students securing FirstClass B.A./B.Com. and M.A. / M.Com. Many students of CDOE have gone abroad seeking higher education in the USA, UK, Australia, Canada, New Zealand etc. Many well-known film personalities have also been enrolled in CDOE.

All programs offered by the Institute under the Faculty of Humanities and Interdisciplinary Studies are approved by the University Grant Commission- Distance Education Bureau (UGC-DEB), New Delhi, vide letter F. No. 1-11/2019 (DEB-I) dated 31/07/2019.

As per ODL regulation CDOE is operating in three tier system as follows

Headquarter, Dr. Shankar Dayal Sharma Bhavan, Vidyanagari Campus, University of Mumbai, Santacruz (East), Mumbai, 400098

CDOE Regional Centers:

1. Vidyarthi Bhavan, B Road, **Churchgate**, Mumbai.

2. **Thane Sub Campus**: University of Mumbai at Balkum, Runwal Garden, Thane-Bhiwandi Road, Balkum Octroi Naka, Thane – 400 608. Student counselling/guidance is available at this centre.

3. **Kalyan Sub Campus:** At Gandhari Village, Vasant Valley Road, Khadakpada, Kalyan (W).

4. **Ratnagiri Sub Campus:** University of Mumbai at Plot No. P-61, MIDC, Mirjole, Ratnagiri. Student counselling/guidance is available at this centre.

5. **Sawantwadi Regional Center**, Sawantwadi, Dist. Sindhudurg.

1.3 AIMS AND OBJECTIVES:

Vision: To position CDOE as a premier ODL institute responsive to emerging needs of learners by providing education for all.
To produce high quality graduates and contribute towards sustainable development of the university by supporting creation of excellence in teaching, learning and research.

Mission: The institute shall strive to promote innovative strategies for creation and dissemination of knowledge using available media and technologies so that university graduates acquire relevant capabilities to contribute with diligence to national development and global knowledge pool through their calibre, professionalism, value system and sense of service.
This will be achieved by providing high quality self learning materials with extensive learner support services and to take education to the needy and promote community participation for local development.

1.4 SPECIAL FEATURES:

The institute is presently located in its own building of about 77,000 square feet area with connectivity.

- Curricular contents, mode of examination and the degrees to be awarded are the same as applicable to the students of the colleges affiliated to the University of Mumbai.
- The learning process of the Institute is mainly through the medium of printed study materials.
- The audio-visual and electronic aids are being added in some subjects as a reference resource.
- The institute is also developing the Virtual Learning Class-rooms (VLC) facility for the students as an additional facility.

* The institute has an independent library and two reading rooms for the students. Fifty thousand books are available with a good number of journals of national and international repute.
* Guidance lectures (Personal Contact Sessions) are conducted every year at about 76 centres in Mumbai and around.
* Counselling to the students during office hours at Headquarters is given by the core faculty.

1.5 INSTRUCTIONAL SYSTEM:

The methodology of instructions at the Centre for Distance and Online Education of the University of Mumbai is different from that of the conventional university/college. Our system is more learner oriented in which the learner is an active participant in the teaching learning process.

CDOE follows the multimedia approach in instructions. It comprises

1. Printed study materials are basically in English and wherever possible in Marathi also. The question-papers in the subject other than languages are printed in English with a Marathi version. The students can write their answers in English, Marathi, Hindi or Gujarati if they indicate their choice for medium of answering in their Examination Form, **if a student writes his /her answers in any language other than Marathi, Hindi, English and Gujarati, their answers will not be assessed and ZERO marks will be awarded.** Students will have to collect their study materials from Room No.005 (Backside), ground floor, CDOE Building on Monday to Friday (11.00a.m. to 5:00p.m.). However, for the students who are unable to make it, they can download the study material from the official website. (www.mu.ac.in)

2. Face to face interaction with teachers and Counseling at CDOE by the core faculty is available between the times 3.00 p.m. to 5.00 p.m. from Monday to Saturday (excluding 2nd & 4thSaturday of every month and public holidays) in Room No. 106 A and 007, CDOE building, University of Mumbai

2. ADMISSION

2.1. ADMISSION SCHEDULE

2.1. ADMISSION SCHEDULE

The students are requested to check the website https://mu.ac.in/distance-open-learning for the updates in the admission schedule.

2.2 ONLINE ADMISSION PROCEDURE:

The admission will be done online. For details the students have to visit our website:

Official website- Students are requested to follow only the official website for all the notices related to Examination & Admission and other important updates	**https://mu.ac.in/distance-open-learning**
Website for admission in First Year Under graduate programmes & Part I & II Post graduate Programmes **For students taking admission in (NEP) Scheme**	**https://mucdoeadm.samarth.edu.in/**
Website for admission in Second & Third Year Under graduate programmes & Part II Post graduate Programmes **For students taking admission in (CBCS) Scheme**	**https://idoloa.digitaluniversity.ac/**

Attestation of Documents

The self-attested copies of documents/papers will be accepted.

It is made clear that if any false attestation / falsified record is detected, the student will be debarred from the University / institute and in addition a criminal case under relevant section of IPC (viz., 471, 474 IPC etc.) will be instituted against him/her.

2.3 PAYMENT OF FEES

The students have to pay the fees through Online by using Debit/ Credit Cards/ Internet Banking.

2.4 ATTESTATION OF DOCUMENTS

The self-attested copies of documents/papers will be accepted.
It is made clear that if any false attestation / falsified record are detected, the student will be debarred from the University / institute and in addition a criminal case under relevant section of IPC (viz, 471, 474 IPC etc) will be instituted against him/her.

2.3. COURSES OFFERED UNDER SCIENCE FACULTY AND ELIGIBILITY CRITERIA AT A GLANCE

{(NEP 2020 Pattern has been implemented for BSCIT and BSCCS Courses for Semester 1 and 2
CBCS pattern scheme implemented from the academic year 2020-21 for the programs of B.Sc.IT & MCA)
(Semester Pattern & CBCS pattern is available for M.Sc. Maths & I.T programs)}

Sr. No.	Course & Eligibility	
1.	**B. Sc. [Information Technology] (Three Years)**	
	F.Y. B. Sc. (IT) **AS PER NEP 2020**	Bachelor of Science (Information Technology) B.Sc. (I.T.): Ordinance No.O.5051 Circular No No.UG./283 of 2007, Dated 16th June, 2007. : (a) A candidate for being eligible for admission to the degree course of Bachelor of Science-Information Technology, shall have passed XII standard examination of the Maharashtra Board of Higher Secondary Education or it's equivalent with Mathematic and Statistics as one of the subject and should have secured not less than 45% marks in aggregate for open category and 40% marks in aggregate in case of Reserved category candidates. (b) Candidate who have passed Diploma (Three years after S.S.C. – Xth Std.) in Information Technology/ Computer Technology/ Computer Engineering/Computer Science/ Electrical, Electronics and Video Engineering and Allied Branches/Mechanical and Allied Branches/ Civil and Allied branches are eligible for direct admission to the Second Year of the B.Sc. (I.T.) degree course. However, the Diploma should be recognized by the Board of Technical Education or any other recognized Government Body. Minimum marks required 45% aggregate for open category candidates and 40% aggregate for reserved category candidates. OR Candidates with post HSC-Diploma in Information Technology/Computer Technology/ Computer Engineering/ Computer Science/ and Allied branches will be eligible for direct admission to the Second Year of B.Sc. (I.T.). However, the Diploma should be recognized by the Board of Technical Education or any other recognized Government Body Minimum Marks required 45% aggregate for open category candidates and 40% aggregate for reserved category candidates.

	S.Y. B. Sc. (IT)	Passed in F.Y.B. Sc. IT or ATKT in OR passed three years' diploma from any recognized state and central board students should have passed in all subjects of F.Y.B.Sc. (IT) and failed not more than 200 marks from University of Mumbai No. UG/235 of 2005. Sem – III The student is eligible for admission to Semester III if either the student passes Semester I & II **OR** The students fail in a combination of Theory and / or practical taken in Semester I or Semester II or together. Where the total marks do not exceed 200. Sem – IV A student is eligible to be admitted to Semester IV irrespective of no. heads of failure in the Third Semester. However, the student has to clear Semester I and II in order to appear for Semester IV examination.
	T.Y. B. Sc. (IT)	Passed in all subjects of F. Y. & S.Y. B. Sc. (IT) or equivalent examination of other universities. Students should have passed in all subjects of FY B. Sc. (IT) and failed not more than 200 marks in SY B.Sc. (IT) from University of Mumbai. No. UG/235 of 2005.
		A student is eligible for admission to Semester V if either the student passes Semester III & IV. OR The student fails in a combination of Theory and / or practical taken in Semester III or Semester IV or together, where the total marks does not exceed 200. OR A student is eligible to be admitted to Semester VI irrespective of no. of heads of failure in the fifth Semester. The results of Semester VI should be kept in abeyance until the students clears Semesters III, IV and V in full.
2.	**B. Sc. [Computer Science] (Three Years)**	
	F.Y. B. Sc. (CS) **AS PER NEP 2020**	Ordinance No.O.5719 Circular No.No.UG./284 of 2007, Dated 16th June,2007 : A candidate for being eligible for admission to the three years integrated course leading to the degree of Bachelor of Science (B.Sc.) must have passed Higher Secondary School Certificate Examination (Std. XII) in Science stream conducted by the Maharashtra State Board of Secondary and Higher Secondary Education with Mathematics and Statistics as one of the subject or its equivalent. Admission will be on merit, based on order of preference as follows: 1. Aggregate Marks at H.S.C. or equivalent. 2. Aggregate Marks in Science Group (Physics, Chemistry and Mathematics) 3. Marks in Mathematics and Statistics and Physics. 4. Marks in Mathematics and Statistics.

	S.Y. B. Sc. (CS)	Passed in F.Y.B. Sc. CS or ATKT in OR passed three years' diploma from any recognized state and central board students should have passed in all subjects of F.Y.B.Sc. (CS) and failed not more than 200 marks from University of Mumbai No. UG/235 of 2005. Sem – III The student is eligible for admission to Semester III if either the student passes Semester I & II **OR** The students fail in a combination of Theory and / or practical taken in Semester I or Semester II or together. Where the total marks do not exceed 200. Sem – IV A student is eligible to be admitted to Semester IV irrespective of no. heads of failure in the Third Semester. However, the student has to clear Semester I and II in order to appear for Semester IV examination.
	T.Y. B. Sc. (CS)	Passed in all subjects of F. Y. & S.Y. B. Sc. (CS) or equivalent examination of other universities. Students should have passed in all subjects of FY B. Sc. (CS) and failed not more than 200 marks in SY B.Sc. (CS) from University of Mumbai. No. UG/235 of 2005. A student is eligible for admission to Semester V if either the student passes Semester III & IV. OR The student fails in a combination of Theory and / or practical taken in Semester III or Semester IV or together, where the total marks does not exceed 200. OR A student is eligible to be admitted to Semester VI irrespective of no. of heads of failure in the fifth Semester. The results of Semester VI should be kept in abeyance until the students clears Semesters III, IV and V in full.
3.	**M. Sc. [Mathematics] (Two Year/4 Semesters from 2020-21)**	
	Part – I	Must have Passed T.Y. B.A./ B.Sc. with Mathematics as a **Major Subject** of this University OR Any Other Statutory University. **(As per the ordinance O.2447)**
	Part – II	M.A./M.Sc.(Maths.) Part-I Students can take admission to M.A./M.Sc.(Maths.) Part-II Course irrespective of Pass or Fail in M.A./M.Sc.(Maths.) Part-I examination. However, they will not be allowed to write Part-II examinations held in the month of Oct/Nov. and submission of M.A./M.Sc.(Maths.) Part-I mark sheet within 10 days from the date of declaration of results.
		O.2443: No candidate will be permitted to appear for the M.A./M.Sc.(Maths.) Part - II examination unless he/she has taken the Bachelor's Degree earlier, in person or in absentia at convocation.

<table>
<tr><td></td><td></td><td>O.2451: Students will not be allowed to appear for the M.A./M.Sc.(Maths.) Part-II examination unless he/she has passed the M.A./M.Sc.(Maths.) Part- I examination, previously.</td></tr>
<tr><td>4.</td><td colspan="2">M. Sc. [Information Technology] (Two Year)</td></tr>
<tr><td></td><td>Part – I</td><td>Must have PASSED B. Sc. with IT/ Comp. Sc./ Maths/ Physics/ Statistics/ Electronics or BCS or BE (in any branch),BCA (As per the Circular No. UG/67 of 2016/17) and (Ordinance No. 6302 & 6303)</td></tr>
<tr><td></td><td>Part II</td><td>M.Sc.IT Part I students can take admission to the Part II course respectively. He/She Passed/Failed in Part I</td></tr>
<tr><td>5.</td><td colspan="2">M.C.A. (Two Year)</td></tr>
<tr><td></td><td>First Year</td><td>O.2646 :- Passed B.Sc. I.T, BCA, B. Sc. Comp. Sc. or Bachelor degree in computer science engineering or equivalent Degree and obtained at least 50% Marks in aggregate 3/4 years (at least 45% in case of candidates of Backward Class Categories, Economically Weaker Section (EWS) and Persons with Disability belonging to Maharashtra State only)

OR

Passed B.Sc./B. Com/B.A. with Mathematics 10+2 level or at Graduate level (with additional bridge courses as per the norms of the University/AICTE) and obtained at least 50% marks aggregate (at least 45% in case of candidates of Backward Class Categories, Economically Weaker Section (EWS) and Persons with Disability belonging to Maharashtra State only) These students has to appear for the Bridge course examination during the first year.

(As per the No. UG/87of 2021)</td></tr>
<tr><td>6</td><td colspan="2">M. Sc. [Computer Science] (Two Year)</td></tr>
<tr><td></td><td>Part-I</td><td>The Bachelor’s degree in the Faculty of Science/ Technology of this University or equivalent degree of recognized Universities with Major and Ancillary Subjects at undergraduate level as detailed below:
<table>
<tr><th>MAJOR</th><th>ANCILLARY</th></tr>
<tr><td>Mathematics</td><td>-</td></tr>
<tr><td>Physics</td><td>Mathematics (4 Units)</td></tr>
<tr><td>Statistics</td><td>Mathematics (4 Units)</td></tr>
</table></td></tr>
</table>

		Life Sciences	**Biochemistry or Chemistry with Mathematics or Statistics in first and second year OR Computer Sciences OR Information Technology up to second year of Bachelor's Degree**
		Medicine	**Chemistry/ Microbiology**
		Bachelor's Degree in Technology (B.Tech./B.E.) in Engineering/ Computer Sciences/ Information Technology	**-**
		Bachelor's Degree in Computer Sciences B.C.A/B.C.S/ Information Technology	**-**

2.4 COURSE WISE FEES

Sr. No.	Course		Fees **	
			General Category	Reserve Category
1.	**B.Sc. (I. T.) (Three Years)**	**F.Y.B.Sc. (I. T.)**	19360/-	4500/-
		S.Y.B.Sc. (I. T.)	19640/-	4980/-
		T.Y.B.Sc. (I. T.)	20890/-	6230/-
2.	**B.Sc. (Computer Science) (Three Years)**	**F.Y.B.Sc. (Comp.Sci) Science)**	17440/-	4500/-
		S.Y.B.Sc. (Computer Science)	19940/-	4480/-
		T.Y.B.Sc. (Computer Science)	22710/-	4730/-
3.	**M.Sc. (Mathematics)**	**Part-I**	9265/-`	4820/-
		Part - II	8490/-	5070/-
4	**M.Sc. (Computer Science) (Two Years)**	**Part-I**	15765/-	5320/-
		Part - II	14990/-	5570/-
5.	**M.Sc. (Information Technology)**	**Part-I**	15765/-	5320/-
		Part - II	14990/-	5570/-
6.	**M.C.A.(Master of Computer Application)**	**First Year**	20260/-	NA
		Second Year	20745/-	NA

- Details for scholarship Students-
https://mu.ac.in/wp-content/uploads/2025/05/Scholarship_2025-2026_Information__Instruction.pdf
- Details for Eligibility case Students –
https://mu.ac.in/wp-content/uploads/2024/06/Eligibility-Case-Information-Instructions.docx.pdf

SECTION-TWO

3. DETAILS OF PROGRAMMES IN FACULTY OF SCIENCE

3.1 B.Sc. COMPUTER SCIENCE

- **Introduction :**

In line with the National Education Policy (NEP) 2020, our revised Computer Science program is designed to instill in students the ability to navigate the ever-changing technological terrain. Recognizing that specific languages and platforms may undergo transformations, the curriculum places a strong emphasis on fostering adaptability. Students will not only be exposed to a diverse array of programming languages, tools, paradigms, and technologies but will also delve into the fundamental principles that underpin the realm of computer science.

- **Aims and Objectives:**

Core Knowledge: Build a solid foundation in Computer Science theories, systems, and practical applications.

Problem Solving: Develop analytical and critical thinking skills to solve real-world problems using computational tools.

Emerging Technologies: Train in cutting-edge computing technologies to foster innovation in industry and academia.

Postgraduate Preparation: Equip students with the skills and knowledge for advanced studies and lifelong learning in CS.

Professional Skills: Prepare students for IT careers with practical experience, ethical awareness, and industry-relevant tools.

Independent & Team Work: Promote effective communication, independent thinking, and collaboration for confident tech use.

- **Learning Outcomes**

At the end of three year Bachelor of Computer Science the students will be able:

Solution Design: Formulate and model effective software-based solutions for real-world problems.

Programming & Systems: Develop programs and systems in areas like networking, web, security, cloud, IoT, and data science.

Innovation & Trends: Stay updated with industry/research trends to create innovative solutions.

Theoretical Application: Apply CS principles to new and complex situations.

Technical Proficiency: Use current tools and techniques essential for modern computing.

Software Engineering: Implement standard practices in real-time software development.

Higher Studies & Careers: Prepare for advanced education or technical roles with confidence.

Teamwork: Collaborate effectively on large projects with strong project management skills.

Communication: Present ideas clearly in both oral and written formats.

Ethics: Practice responsible and ethical computing.

Lifelong Learning: Continuously adapt and learn in a fast-evolving tech landscape.

F.Y.B.Sc (Computer Science) : AS PER NEP 2020

Syllabus for Semester – I & II Ref: GR dated 20th April, 2023 for Credit Structure of UG (With effect from the academic year 2025-26 progressively)

	R: _____ A								
Level	**Semester**	**Major**		**Minor**	**OE**	**VSC, SEC (VSEC)**	**AEC,VEC,IKS**	**CC**	**Cum. Cr. / Sem.**	**Degree/ Cum. Cr**
		Mandatory	Electives							
	I	6		-	2+2	VSC:2, SEC:2	AEC:2, VEC:2, IKS:2	CC:2	22	
		MJ1: Digital Systems & Architecture (TH) – **2** MJ2: Fundamentals of Database Systems (TH)– **2** MJP1: Computer Science Practical 1 (PR) – **2**			**OE I – 02** English Grammar for Competitive Examinations - (Grammar) I **OE II – 02** Logical Reasoning	**VSC - 02** Introduction to Programming with Python – 2 **SEC- 02** Statistics with R Programming – 2	**AEC: -02** Introduction to Communication Skills in English - I **VEC-02** Indian Constitution **IKS:02** Indian Knowledge Systems	Extension Work -**02**		**UG Certificate 44**
4.5	**R:_____ B**									
	II	6		2	2+2	VSC:2 SEC:2	AEC: 2, VEC: 2	CC: 2	22	
		MJ3: Design & Analysis of Algorithms (TH) – **2** MJ4: Object Oriented Programming (TH) – **2** MJP2: Computer Science Practical 2 (PR) – **2**		Programming with Python- **02**	**OE I – 02** English Grammar for Competitive Examinations (Grammar) - II **OE II – 02** Environmental Issues and Management	**VSC -02** Web Technologies – 2 **SEC – 02** Advanced Python Programming	**AEC: -02** **Marathi**: लेखन कौशल्ये २ (कार्यालयीन लेखन व्यवहार व पत्रव्यवहार) OR **Hindi**: हिंदी भाषा – कौशल के आधार **VEC-02** Universal Human Values	Extension Work -**02**		
	Cum Cr.	12	-	2	**8**	**8**	**10**	**4**	**44**	
Exit option: Award of UG Certificate in Major with 40-44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor										

Question Paper Pattern:

THEORY:

Internal Continuous Assessment: 40%	**Semester End Examination: 60%**
Continuous Evaluation through: Class Test on Module 1: 10 marks Class Test on Module 2: 10 marks **Average of 2 Class Tests: 10 marks** Assignment on Module 1: 5 marks Assignment on Module 2: 5 marks **Total of 2 Assignments: 10 marks** **Total: 20 marks**	**Evaluation through:** A **Semester End Theory Examination** of **1 hour duration** for **30 marks** as per the paper pattern given below. **Total: 30 marks**

Format of Question Paper:

Total Marks: 30 **Duration: 1 Hour**

Question	**Based On**	**Options**	Marks
Q. 1	Module 1	*Any 2 out of 4*	10
Q. 2	Module 2	*Any 2 out of 4*	10
Q. 3	Module 1 & 2	*Any 2 out of 4*	10

PRACTICAL:

Internal Continuous Assessment: 40%	**Semester End Examination: 60%**
The internal evaluation will be determined by the completion of practical tasks and the submission of corresponding write-ups for each session. Each practical exercise holds a maximum value of 5 marks. The total evaluation, out of 100 marks, should be scaled down to a final score of 20 marks. **Total: 20 marks**	A **Semester End Practical Examination** of **2 hours duration** for **30 marks** as per the paper pattern given below. **Certified Journal** is **compulsory** for appearing at the time of Practical Exam **Total: 30 Marks**

Format of Question Paper:

Total Marks: 30 **Duration: 2 Hours**

Question	**Practical Question Based On**	**Marks**
Q. 1	Module 1	12
Q. 2	Module 2	12
Q. 3	Viva	06

Examination and Standard of Passing:

NOTE: **As per UGC-DEB regulations, for distance learning programs the examination pattern has been decided to be in 70:30 ratio.**

Regulations regarding the scheme of exams, number of credits and standard of passing will be as prescribed by the University of Mumbai. A student is said to have passed if he/she secures 40% of marks allotted in each head of passing. External evaluation of 30 marks and Internal evaluation of 20 marks are treated as separate heads of passing.

The Ten Point Grading System prescribed by the University of Mumbai will be as follows:

Letter Grades and Grade Points

Semester GPA/ Program CGPA Semester/ Program	% of Marks	Alpha-Sign / Letter GradeResult	Grade Points
9.00-10.00	90.0-100	O (Outstanding)	10
8.00-<9.00	80.0-<90.0	A+ (Excellent)	9
7.00-<8.00	70.0-<80.0	A (Very Good)	8
6.00-<7.00	60.0-<70.0	B+ (Good)	7
5.50-<6.00	55.0-<60.0	B (Above Average)	6
5.00-<5.50	50.0-<55.0	C (Average)	5
4.00-<5.00	40.0-<50.0	P (Pass)	4
Below 4.00	Below 40	F (Fail)	0
Ab (Absent)	-	Absent	0

S.Y.B.Sc. COMPUTER SCIENCE (CBCS - Semester Pattern with 75:25 Scheme of examination, circular no. UG/107 of 2017) (**Study Material Available)**

SEMESTER III			
Course	**TOPICS**	**Credits**	**L / Week**
USCS301	Theory of Computation	2	3
USCS302	Core JAVA	2	3
USCS303	Operating System	2	3
USCS304	Database Management Systems	2	3
USCS305	Combinatorics and Graph Theory	2	3
USCS306	Physical Computing and IoT Programming	2	3
USCS307	Skill Enhancement: Web Programming	2	3
USCSP301	USCS302+USCS303+USCS304	3	9
USCSP302	USCS305+USCS306+USCS307	3	9

SEMESTER IV			
Course	**TOPICS**	**Credits**	**L / Week**
USCS401	Fundamentals of Algorithms	2	3
USCS402	Advanced JAVA	2	3
USCS403	Computer Networks	2	3
USCS404	Software Engineering	2	3
USCS405	Linear Algebra using Python	2	3
USCS406	.NET Technologies	2	3
USCS407	Skill Enhancement: Android Developer Fundamentals	2	3
USCSP401	USCS401+ USCS402+ USCS403	3	9
USCSP402	USCS405+ USCS406+ USCS407	3	9

T.Y.B.Sc. COMPUTER SCIENCE (CBCS - Semester Pattern with 75:25 Scheme of examination, circular no. UG/107 of 2017) (**Study Material Available)**

SEMESTER V			
Course	**TOPICS**	**Credits**	**L / Week**
	Elective-I (Select Any Two)		
USCS501	Artificial Intelligence	3	3
USCS502	Linux Server Administration	3	3
USCS503	Software Testing and Quality Assurance	3	3
	Elective-II (Select Any Two)		
USCS504	Information and Network Security	3	3
USCS505	Architecting of IoT	3	3
USCS506	Web Services	3	3
	Skill Enhancement		
USCS507	Game Programming	2	3
	Practical		
USCSP501	Practical of Elective-I	2	6
USCSP502	Practical of Elective-II	2	6
USCSP503	Project Implementation	1	3
USCSP504	Practical of Skill Enhancement : USCS507	1	3

SEMESTER VI			
Course	**TOPICS**	**Credits**	**L / Week**
	Elective-I (Select Any Two)		
USCS601	Wireless Sensor Networks and Mobile Communication	3	3
USCS602	Cloud Computing	3	3
USCS603	Cyber Forensics	3	3
	Elective-II (Select Any Two)		
USCS604	Information Retrieval	3	3
USCS605	Digital Image Processing	3	3
USCS606	Data Science	3	3
	Skill Enhancement		
USCS607	Ethical Hacking	2	3
	Practical		
USCSP601	Practical of Elective-I	2	6
USCSP602	Practical of Elective-II	2	6
USCSP603	Project Implementation	1	3
USCSP604	Practical of Skill Enhancement : USCS607	1	3

Documents required:

Photo & Signature has to be scan & upload during the Registration process

First Year: - B.Sc. (Comp. Sci.)

Documents required for admission to the old students of CDOE

1 Original mark sheet of First year & Second Year (In case of more than one attempt student should scan & upload first and last mark sheet of the respective class)

2 Previous years Identity Card.

3 Marriage Certificate/ Gazette Notification (For female married students) in case of name change of the student

Documents required for the students from affiliated colleges of University of Mumbai

1 Original mark sheet of First year & Second Year (In case of more than one attempt student should scan & upload first and last mark sheet of the respective class)

2 No Objection Certificate from the last attended college

3 Marriage Certificate/ Gazette Notification (For female married students) in case of name change of the student

INSTRUCTIONS FOR ELIGIBILITY CASE STUDENTS: -

The students from CBSE, ICSE, DIPLOMA from MSBTE/other state, NIOS, HSC Boards other than Maharashtra State, IB, CIE, D. ED and Degree from other than University of Mumbai will have to obtain the Eligibility Certificate which will be issued online after approval from Eligibility Unit, Room No. 108 (A), Centre for Distance and Online Education, Dr. Shankar Dayal Sharma Bhavan, Vidyanagari, Santacruz (E), Mumbai-400 098.

Migration certificate in original shall be submitted within 2 months from date of admission in respective Department of CDOE.

Equivalence certificate shall be submitted by the students wherever required.

Note: - The students who have passed 3/4yr Bachelor's Degree from other University and completed another degree course viz. B. ED, L.L.B., MMS etc. form college affiliated to University of Mumbai and wish to pursue M.A./M.COM/M.Sc./MCA from the University of Mumbai are required to obtain Eligibility Certificate from University of Mumbai, CDOE. Such students should submit their Eligibility 9 Confirmation letter from the earlier College / Institute affiliated to Mumbai University from where he / she has passed B.Ed. /LLB/ MMS / etc.

REQUIRED DOCUMENTS FOR OBTAINING ELIGIBILITY CERTIFICATE:

1. S.S.C. and onwards all examinations (F.Y., S.Y. & T.Y.)

2. Equivalent Certificate from MSBTE/Tech Board of the concern state (in case of diploma students)

3. Passing/ Convocation/ Degree Certificate

4. Marriage Certificate/ Gazette Notification (For female married students)

5. Migration / Transfer Certificate (shall be submitted within 2 months)

FEES FOR ELIGIBILITY CASE:

Document Verification fees of Rs. 400/- will be charged from UG/PG programmes students who have passed their Board/ University Examinations from other than Maharashtra State Higher Secondary Board / other than University of Mumbai (Only for Eligibility Case).

Eligibility fees of Rs. 220/- for the students who have passed their examination from Maharashtra State Universities and Diploma from MSBTE and Rs. 320/- for out of Maharashtra State Universities /Boards other than Maharashtra /Technical Boards of other States.

3.2 B.Sc. INFORMATION TECHNOLOGY

- **Introduction:**

The aims and objectives of a Bachelor of Science (B.Sc) program in Information Technology (IT) generally revolve around providing students with a comprehensive understanding of the principles, technologies, and applications within the field of information technology. The entire program collectively aim to produce graduates who are well-rounded IT professionals, capable of contributing to the design, development, and management of information technology systems in various industries. The specific details of the curriculum may vary among institutions offering B.Sc in Information Technology programs.

- **Aims and Objectives:**

The aims and objectives of a Bachelor of Science (B.Sc) program in Information Technology (IT) generally revolve around providing students with a comprehensive understanding of the principles, technologies, and applications within the field of information technology. The entire program collectively aim to produce graduates who are well-rounded IT professionals, capable of contributing to the design, development, and management of information technology systems in various industries. The specific details of the curriculum may vary among institutions offering B.Sc in Information Technology programs.

- **Learning Outcomes:**

The B. Sc. (Information Technology) Programme shall prepare and enable the graduates to: Demonstrate proficiency in programming languages, Data structures, Design and implement software solutions with their technical competence Analyze user requirements and design effective IT systems or applications. Apply system analysis and design methodologies to address complex business challenges. Acquire the skills of Database Management, Networking and Security, Web Technologies Plan, execute, monitor, and control IT projects. Analyze and solve complex IT problems using critical thinking skills. Apply concepts of artificial intelligence, machine learning, cloud computing, and IoT Effectively communicate technical information both orally and in writing.

F.Y.B.Sc (Information Technology) : AS PER NEP 2020

Syllabus for Semester – Sem I & II Ref: GR dated 20th April, 2023 for Credit Structure of UG (With effect from the academic year 2025-26 Progressively)

	R: _____ A								
Level	**Semester**	**Major**		**Minor**	**OE**	**VSC, SEC (VSEC)**	**AEC,VEC,IKS**	**CC**	**Cum. Cr. / Sem.**	**Degree/ Cum. Cr**
		Mandatory	Electives							
	I	6		-	2+2	VSC:2, SEC:2	AEC:2, VEC:2, IKS:2	CC:2	22	
		Programming with C **-02** Database Management Systems **-02** Practical I – **02**			**OE I – 02** English Grammar for Competitive Examinations - (Grammar) I **OE II – 02** Logical Reasoning	**VSC - 02** Combinational & Sequential Design **SEC- 02** Office Tools for Data Management	**AEC: -02** Introduction to Communication Skills in English - I **VEC-02** Indian Constitution **IKS:02** Indian Knowledge Systems	Extension Work - - **02**		
4.5	**R: _____ B**									
	II	6		2	2+2	VSC:2 SEC:2	AEC: 2, VEC: 2	CC: 2	22	**UG Certificate 44**
		OOPs with C++ **-02** Web Designing **-02** Practical II – **02**		IT Fundamentals of Python Programming **- 02**	**OE I – 02** English Grammar for Competitive Examinations –(Grammar) II **OE II – 02** Environmental Issues and Management	**VSC -02** Assembly Language Programming **SEC – 02** Web Programming	**AEC: -02** **Marathi**: लेखन कौशल्ये १ (कार्यालयीन लेखन व्यवहार व पत्रव्यवहार) OR **Hindi**: हिंदी भाषा – कौशल के आधार **VEC-02** Universal Human Values	Extension Work **-02**		
	Cum Cr.	12	-	2	**8**	**8**	**10**	**4**	**44**	
Exit option: Award of UG Certificate in Major with 40-44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor										

Paper Pattern: Theory and Practicals

QUESTION PAPER PATTERN

(External and Internal)

I	**A Theory of 2 credits is evaluated for a total of 50 Marks**	
	Internal Continuous Assessment:	**40%[20 Marks]**
	Continuous Evaluation through: Class test of 1 of 15 marks Class test of 2 of 15 marks Average of the two: 15 marks Quizzes/ Presentations/ Assignments: 5 marks Total: 20 marks	
	External Semester End Examination: 60%[30 Marks]	
	Format of Question Paper: (Semester End Examination : 30 Marks. Duration:1 hour) Q1: Attempt any two (out of four) from Module 1 (15 marks) Q2: Attempt any two (out of four) from Module 2 (15 marks)	
II	**A Practical of 2 credits is evaluated for a total of 50 Marks**	
	Internal Continuous Assessment:	**40%[20 Mrks]**
	Continuous Evaluation through: Students are expected to attend each practical and submit the written practical of the previous session. Performing Practical and writeup submission will be continuous internal evaluation. 2.5 marks can be awarded for each practical performance and writeup submission totalling to 50 marks and can be converted to 20 marks.	
	Semester End Examination: 60%[30 Marks]	
	Format of Question Paper: Duration 2 hours. Certified copy of Journal is compulsory to appear for the practical examination(30 Marks) Practical Slip: Q1. From Module 1 13 marks Q2. From Module 2 12marks Q3. Journal and Viva 05 marks	

Examination and Standard of Passing:

NOTE: **As per UGC-DEB regulations, for distance learning programs the examination pattern has been decided to be in 70:30 ratio.**

Regulations regarding the scheme of exams, number of credits and standard of passing will be as prescribed by the University of Mumbai. A student is said to have passed if he/she secures 40% of marks allotted in each head of passing. External evaluation of 30 marks and Internal evaluation of 20 marks are treated as separate heads of passing.

The Ten Point Grading System prescribed by the University of Mumbai will be as follows:

Letter Grades and Grade Points

Semester GPA/ Program CGPA Semester/ Program	% of Marks	Alpha-Sign / Letter GradeResult	Grade Points
9.00-10.00	90.0-100	O (Outstanding)	10
8.00-<9.00	80.0-<90.0	A+ (Excellent)	9
7.00-<8.00	70.0-<80.0	A (Very Good)	8
6.00-<7.00	60.0-<70.0	B+ (Good)	7
5.50-<6.00	55.0-<60.0	B (Above Average)	6
5.00-<5.50	50.0-<55.0	C (Average)	5
4.00-<5.00	40.0-<50.0	P (Pass)	4
Below 4.00	Below 40	F (Fail)	0
Ab (Absent)	-	Absent	0

Photo & Signature has to be scan & upload during the Registration process

F.Y.B.Sc (Information and Technology)

- **Documents required for admission to the old students of CDOE**

Date of Birth Proof-two copies

1. Proof of residence
2. Affix three passport size photographs on each of the following: admission form, examination form, and identity card.
3. Statement of marks (all attempts of all lower exams) is required to be submitted.
4. XII std. Original mark sheet and Original passing certificate. If the students belong to another board, students need to submit their Migration Certificate after the completion of the admission process.
5. Original leaving certificate +tree Xerox copies.
6. Marriage Certificate/ Gazette Notification (For female married students) in case of name change of the student

- **Documents required for the students from affiliated colleges of University of Mumbai**

1. Original mark sheet of first year and in case of more than one attempt student Should scan & upload the first and last mark sheet of the respective class.
2. No Objection Certificate from the last attended college
3. Marriage Certificate/ Gazette Notification (For female married students) in case of name change of the student.

S.Y.B.Sc (Information Technology): - (CBCS - Semester Pattern (w.e.f. Academic Year 2021-2022) with 75:25 Scheme of examination circular no. UG/176). Revised syllabus from 2021-22.

Semester – 3			
Course Code	**Course Type**	**Course Title**	**Credits**
USIT301	Skill Enhancement Course	Python Programming	2
USIT302	Core Subject	Data Structures	2
USIT303	Core Subject	Computer Networks	2
USIT304	Core Subject	Database Management Systems	2
USIT305	Core Subject	Applied Mathematics	2
USIT3P1	Skill Enhancement Course Practical	Python Programming Practical	2
USIT3P2	Core Subject Practical	Data Structures Practical	2
USIT3P3	Core Subject Practical	Computer Networks Practical	2
USIT3P4	Core Subject Practical	Database Management Systems Practical	2
USIT3P5	Core Subject Practical	Mobile Programming Practical	2
		Total Credits	**20**

Semester – 4			
Course Code	**Course Type**	**Course Title**	**Credits**
USIT401	Skill Enhancement Course	Core Java	2
USIT402	Core Subject	Introduction to Embedded Systems	2
USIT403	Core Subject	Computer Oriented Statistical Techniques	2
USIT404	Core Subject	Software Engineering	2
USIT405	Core Subject	Computer Graphics and Animation	2
USIT4P1	Skill Enhancement Course Practical	Core Java Practical	2
USIT4P2	Core Subject Practical	Introduction to Embedded Systems Practical	2
USIT4P3	Core Subject Practical	Computer Oriented Statistical Techniques Practical	2
USIT4P4	Core Subject Practical	Software Engineering Practical	2
USIT4P5	Core Subject Practical	Computer Graphics and Animation Practical	2
		Total Credits	**20**

- **Documents required:**

  Photo & Signature has to be scan & upload during the Registration process

  S.Y. B. Sc. (Information Technology)

  Documents required for admission to the old students of CDOE

  1. Original mark sheet of First year and in case of more than one attempt student should scan & upload first and last mark sheet of the respective class.
  2. Previous year Identity Card.
  3. Marriage Certificate/ Gazette Notification (For female married students)

- **Documents required for the students from affiliated colleges of University of Mumbai**

  1. Original mark sheet of first year and in case of more than one attempt student Should scan & upload the first and last mark sheet of the respective class.

2. No Objection Certificate from the last attended college.
3. Marriage Certificate/ Gazette Notification (For female married students) in case of name change of the student.

For the current academic year, students have to submit their Diploma passing certificates at the time of admission. The students who passed their Diploma examination in March of the current year have to submit their Diploma passing Certificate in the month of December in the current academic year.

* Original certificate will be returned after verification of form.
# Students admitted on provisional on eligibility Certificate required to submit their original Migration Certificate.

Note:

1. The 75% 25% pattern has been introduced for BSc.IT from the academic year 2020-2021(**circular no. UG/176**)
2. For theory per paper is 100 marks: 75 marks out of 100 marks will be external and 25 marks out of 100 marks would be internals
3. For practical, per paper is 50 marks: 40 marks out of 50 marks will be practicals and 10 marks out of 50 will be viva and journal report.
4. Theory internal assessment is of objective type/test based on the subject knowledge
5. Practical internal assessment if based on problem solving ability and practical skill assess during lecture sessions

Standard of Passing:

1. In the 75:25 scheme of examination every paper is considered as a separate head of passing.
2. Minimum passing marks required in every head is 40% (Theory + Practical)
3. To pass the theory examination student must secure minimum 30 marks out of 75 marks
4. To pass the internal examination student must secure minimum 10 marks out of 25 marks
5. To pass the practical examination student must secure minimum 20 marks out of 50 marks

T.Y.B.Sc (Information Technology): - (CBCS - Semester Pattern (w.e.f. Academic Year 2021-2022) with 75:25 Scheme of examination circular no. UG/176). Revised syllabus from 2021-22.

SEMESTER 5		
Course code	**Course Title**	**Credits**
USIT501	Software Project Management	2
USIT502	Internet of Things	2
USIT503	Advanced Web Programming	2
USIT504	Artificial Intelligence	2
USIT506	Enterprise Java	2
USIT5P1	Project Dissertation	2
USIT5P2	Internet of Things Practical	2
USIT5P3	Advanced Web Programming Practical	2
USIT5P4	Artificial Intelligence Practical	2
USIT5P6	Enterprise Java Practical	2
Total Credits		**20**

(All the practical mentioned in the syllabi are compulsory as per the courses)

SEMESTER 6		
Course code	**Course Title**	**Credits**
USIT601	Software Quality Assurance	2
USIT602	Security in Computing	2
USIt603	Business Intelligence	2
USIT604	Principles of Geographic Information Systems	2
USIT606	IT Service Management	2
USIT6P1	Project Implementation	2
USIT5P2	Security in Computing Practical	2
USIT5P3	Business Intelligence Practical	2
USIT5P4	Principles of Geographic Information Systems Practical	2
USIT5P6	Advanced Mobile Programming	2
Total Credits		**20**

- **Documents required:**

Photo & Signature has to be scan & upload during the Registration process

TY B. Sc. (Information Technology)

Documents required for admission to the old students of CDOE

1. Original mark sheet of First year & Second Year (In case of more than one attempt student should scan & upload first and last mark sheet of the respective class)
2. Previous years Identity Card.

3. Marriage Certificate/ Gazette Notification (For female married students) in case of name change of the student

- **Documents required for the students from affiliated colleges of University of Mumbai**

1. Original mark sheet of First year & Second Year (In case of more than one attempt student should scan & upload first and last mark sheet of the respective class)
2. No Objection Certificate from the last attended college
3. Marriage Certificate/ Gazette Notification (For female married students) in case of name change of the student

Note:

1. The 75% 25% pattern has been introduced for BSc.IT from the academic year 2020-2021(**circular no. UG/176**)
2. For theory per paper is 100 marks: 75 marks out of 100 marks will be external and 25 marks out of 100 marks would be internals
3. For practical, per paper is 50 marks: 40 marks out of 50 marks will be practicals and 10 marks out of 50 will be viva and journal report.
4. Theory internal assessment is of objective type/test based on the subject knowledge
5. Practical internal assessment if based on problem solving ability and practical skill assess during lecture sessions

Note for Project:

Semester 5 - Project Dissertation

Semester 6 - Project Implementation

*** NOTE ABOUT PROJECT VIVA VOCE:**

Student may be asked to write code for problem during VIVA to demonstrate his coding capabilities and he/she may be asked to write any segment of coding used in the in the project. The project can be done in group of at most four students. However, the length and depth of the project should be justified for the projects done in group. A big project can be modularised and different modules can be assigned as separate project to different students.

Marks Distribution:

Semester V: 50 Marks

Documentation: 50 marks

Semester VI: 150 Marks

Documentation: 50 Marks:

Implementation and Viva Voce: 100 Marks

The plagiarism should be maintained as per the UGC guidelines.

Standard of Passing:

1. In the 75:25 scheme of examination every paper is considered as a separate head of passing.
2. Minimum passing marks required in every head is 40% (Theory + Practical)
3. To pass the theory examination student must secure minimum 30 marks out of 75 marks
4. To pass the internal examination student must secure minimum 10 marks out of 25 marks

5. To pass the practical examination student must secure minimum 20 marks out of 50 marks

EVALUATION SCHEME

Internal Examination : (25 mark) : Conducted online MCQ Based

External Examination: (75 marks)

	All questions are compulsory	
Q1	(Based on Unit 1) Attempt *any three* of the following:	15
a.		
b.		
c.		
d.		
e.		
f.		
Q2	(Based on Unit 2) Attempt *any three* of the following:	15
Q3	(Based on Unit 3) Attempt *any three* of the following:	15
Q4	(Based on Unit 4) Attempt *any three* of the following:	15
Q5	(Based on Unit 5) Attempt *any three* of the following:	15

Practical Exam: 50 marks

A Certified copy journal is essential to appear for the practical examination.

1.	Practical Question 1	20
2.	Practical Question 2	20
3.	Journal	5
4.	Viva Voce	5

REQUIRED DOCUMENTS FOR OBTAINING ELIGIBILITY CERTIFICATE:

1. S.S.C. and onwards all examinations (F.Y., S.Y. & T.Y.)

2. Equivalent Certificate from MSBTE/Tech Board of the concern state (in case of diploma students)

3. Passing/ Convocation/ Degree Certificate

4. Marriage Certificate/ Gazette Notification (For female married students)

5. Migration / Transfer Certificate (shall be submitted within 2 months)

FEES FOR ELIGIBILITY CASE:

Document Verification fees of Rs. 400/- will be charged from UG/PG programme students who have passed their Board/ University Examinations from other than Maharashtra State Higher Secondary Board / other than University of Mumbai (Only for Eligibility Case).

Eligibility fees of Rs. 220/- for the students who have passed their examination from Maharashtra State Universities and Diploma from MSBTE and Rs. 320/- for out of Maharashtra State Universities /Boards other than Maharashtra /Technical Boards of other State.

POST GRADUATE PROGRAMMES

3.3 M.A./M.Sc. (Mathematics)

Eligibility for Admission to MSc (Mathematics)-I

As per University of Mumbai circular **No. PG/ Univ./VCD/ ICC / 2012-13/ 8,** *A learner for being eligible to apply for admission to the M.A./M.Sc. degree course by papers must have passed :-* ***The B.A./B.Sc. degree examination*** *of this university or degree of any other university recognized as equivalent thereto with* ***minimum 46 credits*** *or its equivalent (i.e, the minimum credits required for majoring in a subject and excluding the credits for optional courses) of the subject which he wants to offer for the M.A./M.Sc. degree course by papers.*

Part – I (As per NEP-2020)

Course Code	Course	Mandatory/Elective	Credit
Semester-I Level (6.0)			
5130161501	Algebra I	Mandatory	4
5130161502	Real Analysis	Mandatory	4
5130161503	Ordinary Differential Equations	Mandatory	4
5130161504	Discrete Mathematics and Number Theory	Mandatory	2
5130161505	Research Methodology	Mandatory	4
Elective Course			
513016150612	Graph Theory	Elective	4

		Total Credits:	**22**

Course Code	Course	Mandatory/Elective	Credit
Semester-II Level (6.0)			
5130162511	Algebra II	Mandatory	4
5130162512	Topology	Mandatory	4
5130162513	Complex Analysis	Mandatory	4
5130162514	Partial Differential Equations	Mandatory	2
5130162515	FP (Field Project)	Mandatory	4
Elective Course			
513016251614	Numerical Analysis	Elective	4
		Total Credits:	**22**

Part – II (As per NEP2020)

SEMESTER III (Level 6.5)			
Course Code	**Course**	**Mandatory/Elective**	**Credit**
5130163551	Algebra III	Mandatory	4
5130163552	Differential Geometry	Mandatory	4
5130163553	Measure Theory and Integration	Mandatory	4
5130163554	Probability Theory and Statistics	Mandatory	2
5130163555	Research Project	Mandatory	4
513016355620	R Programming	Elective	4
		Total Credits	**22**

SEMESTER IV (Level 6.5)			
Course Code	**Course**	**Mandatory/Elective**	**Credit**
5130164561	Algebra IV	Mandatory	4
5130164562	Fourier Analysis	Mandatory	4
5130164563	Functional Analysis	Mandatory	4
5130164564	Research Project	Mandatory	6
513016456514	Calculus on Manifolds	Elective	4
		Total Credits	**22**
		Cumulative Credits (SEM-I, SEM-II, SEM-III and SEM-IV):	**88**

Scheme of Examination (70:30):- There will be separate heads of passing for the internal and the external examination.
The internal examination will be conducted online on the LMS or on any other platform provided by CODE.
The semester end examination will be conducted as per the University norm.

For almost all courses, then entire e-content will be shared on our LMS

1. The video lectures and learning material will be from Open Educational

Resources (OER) and SWAYAM MOOCS on the Learning Management System(LMS) of CODE.
2. Internal assessment will be conducted on the LMS.
3. Learners have to do self study from the learning materials on the LMS. No print material and counseling sessions will be conducted.
4. Semester End examination will be as per University norms.

As per the BoS of Mathematics resolution the following are details about the Project work:

Evaluation of Project work

The evaluation of the Project submitted by a student shall be made by a Committee appointed by the Head of the Department of Mathematics of the respective college.

The presentation of the project is to be made by the student in front of the committee appointed by the Head of the Department of Mathematics of the respective college. This committee shall have two members, possibly with one external referee.

Each project output shall be displayed on the website of the University.

The Marking scheme for the project of 4 credits are detailed below:

I. Literature Review : 10 Marks
II. Contents of the project : 30 Marks
III. Main Output of the Project : 10 Marks
IV. Use of e-learning resources : 10 Marks
V. Presentation of the project : 20 Marks
VI. Viva of the project : 20 Marks
VII. Total Marks : 100 Marks per project per student

The Marking scheme for the project of 6 credits are detailed below:

I. Literature Review : 10 Marks
II. Contents of the project : 60 Marks
III. Main Output of the Project : 20 Marks
IV. Use of e-learning resources : 20 Marks
V. Presentation of the project : 20 Marks
VI. Viva of the project : 20 Marks
VII. Total Marks : 150 Marks per project per student

As per the M. Sc. (Maths) Class Improvement ordinance 0.2462 student has to appear for class Improvement within 5 years from the passing years. (Please see link

http://archive.mu.ac.in/myweb_test/M.A.%20MSc.%20%28Maths%29%20Class%20Improvement%20Ordinance.pdf)

Documents required: Students should scan & upload all the required documents in Original.

Photo & Signature has to be scan during the Registration process

Part- I: - M. A. / M.Sc. (Mathematics)

Documents required for admission to the old students of CDOE

1. Original mark sheet of First year and in case of more than one attempt student should upload the first and last mark sheet of the respective class.
2. Previous year Identity Card.
3. Marriage Certificate/ Gazette Notification (for female married students) in case of name change of the student

Documents required for the students from affiliated colleges of University of Mumbai

1. Original mark sheet of first year and in case of more than one attempt student should upload first and last mark sheet of the respective class
2. Marriage Certificate/ Gazette Notification (For female married students) in Case of name change of the student

Documents required:

Photo & Signature has to be scan & upload during the Registration process

Part- II: - M.A/M.Sc. (Mathematics)

Documents required for admission to the old students of CDOE

1. Original mark sheet of First year and in case of more than one attempt. Students should scan & upload the first and last mark sheet of the respective class.
2. Previous year Identity Card.
3. Convocation certificate
4. Marriage Certificate/ Gazette Notification (for female married students) in case of name change of the student

Documents required for the students from affiliated colleges of University of Mumbai

1. Original mark sheet of first year and in case of more than one attempt. Students should scan & upload the first and last mark sheet of the respective class.
2. Current Year No Objection Certificate from the last attended college
3. Convocation certificate
4. Marriage Certificate/ Gazette Notification (For female married students) in case of name change of the student

INSTRUCTIONS FOR ELIGIBILITY CASE STUDENTS: -

The students from CBSE, ICSE, DIPLOMA from MSBTE/other state, NIOS, HSC Boards other than Maharashtra State, IB, CIE, D. ED and Degree from other than University of Mumbai will have to obtain

the Eligibility Certificate which will be issued online after approval from Eligibility Unit, Room No. 108 (A), Centre for Distance and Online Education, Dr. Shankar Dayal Sharma Bhavan, Vidyanagari, Santacruz (E), Mumbai-400 098.

Migration certificate in original shall be submitted within 2 months from date of admission in respective Department of CDOE.

Equivalence certificate shall be submitted by the students wherever required.

Note: - The students who have passed 3/4yr Bachelor's Degree from other University and completed another degree course viz. B. ED, L.L.B., MMS etc. form college affiliated to University of Mumbai and wish to pursue M.A./M.COM/M.Sc./MCA from the University of Mumbai are required to obtain Eligibility Certificate from University of Mumbai, CDOE. Such students should submit their Eligibility 9 Confirmation letter from the earlier College / Institute affiliated to Mumbai University from where he / she has passed B.Ed. /LLB/ MMS / etc.

REQUIRED DOCUMENTS FOR OBTAINING ELIGIBILITY CERTIFICATE:

1. S.S.C. and onwards all examinations (F.Y., S.Y. & T.Y.)

2. Equivalent Certificate from MSBTE/Tech Board of the concern state (in case of diploma students)

3. Passing/ Convocation/ Degree Certificate

4. Marriage Certificate/ Gazette Notification (For female married students)

5. Migration / Transfer Certificate (shall be submitted within 2 months)

FEES FOR ELIGIBILITY CASE:

Document Verification fees of Rs. 400/- will be charged from UG/PG programmeϖ students who have passed their Board/ University Examinations from other than Maharashtra State Higher Secondary Board / other than University of Mumbai (Only for Eligibility Case).

Eligibility fees of Rs. 220/- for the students who have passed their examination from Maharashtra State Universities and Diploma from MSBTE and Rs. 320/- for out of Maharashtra State Universities /Boards other than Maharashtra /Technical Boards of other States.

3.4 M.Sc. (Computer Science) (Two Year) - As Per NEP 2020

Introduction:

The Master of Science in Computer Science (M.Sc. Computer Science) is an advanced program that combines academic research and industry standards, addressing the evolving needs of both the industry and research domains. The curriculum focuses on cutting-edge technologies and industry insights, ensuring students gain the necessary expertise to thrive in the current landscape.

Throughout this program, students will delve into a wide range of relevant subjects. In the first year, they study subjects including Machine Learning, Image Processing, Networking, Blockchain, Cloud Computing, Big Data, Computer and Network Security, Web Data Mining, and Simulation and Modelling. In the M.Sc. second year program, students will engage with major mandatory subjects such as Web3 Technologies, Cyber Security and Risk Assessment, Ethical & Responsible AI, Deep Learning, and Big Data Analytics. They can also choose from major elective subjects like Social Network Analysis or Data Visualization or Fuzzy Systems, as well as Trends in Cloud Computing or Remote Sensing or Server Virtualization. Research projects in both semesters provide practical experience and foster critical skills. This comprehensive curriculum equips students with the latest knowledge and prepares them for diverse opportunities in computer science. These courses are carefully designed to equip students with the skills required to tackle the challenges and opportunities in the rapidly expanding field of Computer Science. The program is structured as a fusion of Major Mandatory and Major Elective courses, encompassing the latest trends and advancements in Computer Science. In each semester, students have the opportunity to choose one elective subject aligned with their interests from a selection of three options. The Major Mandatory courses establish a strong foundation in fundamental concepts of Computer Science and Research, while the electives enhance their knowledge for real-world applications. Practical implementation is facilitated through the use of industry-standard tools and simulators, such as Cisco for networking and Python for programming.

To further enhance the students; readiness for industry, the curriculum incorporates a mandatory On Job Training (OJT) component in Semester II. This intensive training, equivalent to a full course, provides invaluable exposure to real-world scenarios within IT or IT-related organizations. By applying their theoretical knowledge in practical settings, students gain firsthand experience and develop the necessary skills to thrive in the professional world. In addition to technical skills, this program also focuses on cultivating research ethics and promoting a research-oriented mindset among learners. The inclusion of a Research Methodology Course helps students develop a strong research attitude, enabling them to contribute meaningfully to the advancement of Computer Science. The comprehensive education provided by the M.Sc. in Computer Science program equips students with the confidence to adapt and excel in an ever evolving industry and academic landscape. The curriculum's continuous refinement has been made possible through the valuable inputs, suggestions, and observations of colleagues at the University of Mumbai, experts from premier institutions, and industry professionals. We extend our gratitude to all those who have directly or indirectly contributed to the development of this program. With these combined efforts, the M.Sc.

in Computer Science program aims to empower students with the skills and knowledge necessary to thrive in the digital world.

Aims and Objectives

The aims and objectives of the M.Sc. Computer Science program collectively aim to develop well-rounded computer science professionals who are not only technically competent but also capable of contributing to research, innovation, and the overall advancement of the field.

Objectives:

Provide In-depth Knowledge

The program aims to provide students with a comprehensive understanding of the key concepts, theories, and methodologies in Computer Science. It covers a range of topics including machine learning, data mining, data visualization, and data management, enabling students to develop a deep knowledge base in these areas.

Develop Programming Skills: The program aims to equip students with strong programming skills by providing hands-on experience with different tools and technologies. Students will gain proficiency in designing front-end and back-end solutions, enhancing their ability to develop robust and scalable applications.

Foster Problem-solving Abilities: The program aims to enhance students' problem solving abilities by training them to approach real-world data challenges critically and creatively. Students will learn to identify problems, design appropriate data analysis strategies, and develop innovative solutions using their knowledge of Computer Science.

Encourage Collaboration and Teamwork: The program aims to foster collaboration and teamwork skills among students, recognizing that computer science projects often require interdisciplinary collaboration. Students will learn to effectively communicate, collaborate, and contribute as part of a team, preparing them for collaborative work environments.

Foster Industry Relevance: The program aims to stay up-to-date with industry trends and technologies to ensure graduates are well-prepared for the demands of the Computer Science job market. Through industry partnerships and internships, students will have the opportunity to gain practical experience and stay in touch with the latest advancements in the field.

Professional Development: The program aims to prepare students for successful careers in the field of Computer Science. In addition to technical skills, students will develop professional skills such as teamwork, project management, and leadership. The program may also provide networking opportunities, internships, or collaborations with industry partners to enhance students' industry readiness and employability.

Cultivate Research Skills: The program aims to cultivate research skills among students by providing a Research Methodology Course and encouraging participation in research projects. Students will

learn to conduct literature reviews, design experiments, analyze data, and present their findings, fostering a research-oriented mindset and contributing to the advancement of Computer Science.

By incorporating these objectives, the M.Sc. Computer Science program aims to produce graduates who possess a strong foundation in Computer Science, are adept at problem solving and collaboration, have industry-relevant skills, and are well-prepared for both research and professional roles in the field.

Learning Outcomes

Develop a solid foundation in fundamental concepts, theories, and methodologies of Computer Science. Offer opportunities for specialization in a chosen area of Computer Science. Foster a research-oriented mindset and contribute to the advancement of Computer Science. Prepare learners for lifelong learning, adapting to emerging technologies and industry requirements. Inculcate professional attitudes, leadership qualities, and social responsibility. Equip students with industry-relevant skills and experiences for successful careers. Enhance critical thinking and innovative problem-solving abilities.

Syllabus

SUBJECTS (Sem I and Sem II)

<table>
<tr><th rowspan="2">Year</th><th rowspan="2">Level</th><th rowspan="2">Sem</th><th colspan="4">Major</th><th rowspan="2">RM</th><th rowspan="2">OJT/FP</th><th rowspan="2">RP</th><th rowspan="2">Cum. Cr.</th><th rowspan="2">Degree</th></tr>
<tr><th colspan="3">Mandatory</th><th>Electives</th></tr>
<tr><td rowspan="12">1</td><td rowspan="12">6.0</td><td rowspan="6">Sem I</td><td colspan="3">2*4+2*2+2</td><td>4</td><td>4</td><td rowspan="6">-</td><td rowspan="6">-</td><td rowspan="6">22</td><td rowspan="12">PG Diploma (after 3Years Degree)</td></tr>
<tr><td>Applied Signal &Image Processing (501)</td><td>TH</td><td>4</td><td rowspan="5">NoSQL Technologies (506a) 2 TH+2 PR
(OR)
Robotic (506b) 2 TH +2PR
(OR)
UI/UX Design (506c) 2 TH +2 PR</td><td rowspan="5">Research Methodology (510)</td></tr>
<tr><td>Applied Signal & Image Processing Practical (502)</td><td>PR</td><td>2</td></tr>
<tr><td>Software Defined Networking(503)</td><td>TH</td><td>4</td></tr>
<tr><td>Software Defined Networking Practical (504)</td><td>PR</td><td>2</td></tr>
<tr><td>Principles of Compiler Design(505)</td><td>TH</td><td>2</td></tr>
<tr><td rowspan="6">Sem II</td><td colspan="3">2*4+2*2+2</td><td>4</td><td>-</td><td rowspan="6">OJT (517) 4</td><td rowspan="6">-</td><td rowspan="6">22</td></tr>
<tr><td>Machine Learning (511)</td><td>TH</td><td>4</td><td rowspan="5">Bioinformatics (516a) 2 TH + 2PR
(OR)
Embedded and IoT Technology (516b) 2 TH +2PR
(OR)
Web Data Analytics (516c) 2 TH +2PR</td><td rowspan="5">-</td></tr>
<tr><td>Machine Learning Practical(512)</td><td>PR</td><td>2</td></tr>
<tr><td>Natural Language Processing(513)</td><td>TH</td><td>4</td></tr>
<tr><td>Natural Language Processing Practical (514)</td><td>PR</td><td>2</td></tr>
<tr><td>Simulation and Modelling (515)</td><td>TH</td><td>2</td></tr>
<tr><td colspan="3">Cum.Cr. For PG Diploma</td><td colspan="3">28</td><td>8</td><td>4</td><td>4</td><td></td><td>44</td><td></td></tr>
<tr><td colspan="12">Exit Option : PG Diploma (44 credits) after Three Year UG Degree</td></tr>
</table>

SUBJECTS (Sem III and Sem IV)

<table>
<tr><th rowspan="2">Year</th><th rowspan="2">Level</th><th rowspan="2">Sem (2yr)</th><th colspan="3">Major</th><th rowspan="2">RM</th><th rowspan="2">OJT/FP</th><th rowspan="2">RP</th><th rowspan="2">Cum.Cr.</th><th rowspan="2">Degree</th></tr>
<tr><th colspan="3">Mandatory</th><th>Electives</th></tr>
<tr><td rowspan="6">2</td><td rowspan="6">6.5</td><td rowspan="5">Sem III</td><td colspan="3">2*4+2*2+2</td><td>4</td><td rowspan="5">-</td><td rowspan="5">-</td><td rowspan="5">RP (607)
4</td><td rowspan="5">22</td><td rowspan="11">PG Degree after 3-yr UG</td></tr>
<tr><td>Web3Technologies (601)</td><td>TH</td><td>4</td><td rowspan="5">Social Network Analysis (606a) 2 TH +2PR
(OR)
Data Visualization (606b) 2 TH+2 PR
(OR)
Fuzzy Systems (606c)
2 TH +2PR</td></tr>
<tr><td>Web3 Technologies Practical (602)</td><td>PR</td><td>2</td></tr>
<tr><td>Cyber Security and Risk Assessment (603)</td><td>TH</td><td>4</td></tr>
<tr><td>Cyber Security and Risk Assessment Practical (604)</td><td>PR</td><td>2</td></tr>
<tr><td>Ethical & Responsible AI (605)</td><td>TH</td><td>2</td></tr>
<tr><td rowspan="5">Sem IV</td><td colspan="3">2*4+2*2</td><td>4</td><td rowspan="5">-</td><td rowspan="5">-</td><td rowspan="5">RP (616)</td><td rowspan="5">22</td></tr>
<tr><td>Deep Learning(611)</td><td>TH</td><td>4</td><td rowspan="5">Trends in cloud computing (615a) 2 TH +2PR
(OR)
Remote Sensing (615b) 2 TH +2PR
(OR)
Server Virtualization (615c) 2 TH +2PR</td></tr>
<tr><td>Deep Learning Practical (612)</td><td>PR</td><td>2</td></tr>
<tr><td>Big Data Analytics (613)</td><td>TH</td><td>4</td></tr>
<tr><td>Big Data Analytics Practical (614)</td><td>PR</td><td>2</td></tr>
<tr><td colspan="3">Cum.Cr. For 1 Yr PG Degree</td><td colspan="3">26</td><td>8</td><td></td><td></td><td>10</td><td>44</td></tr>
<tr><td colspan="3">Cum.Cr. For 2 Yr PG Degree</td><td colspan="3">54</td><td>16</td><td>4</td><td>4</td><td>10</td><td>88</td></tr>
</table>

EVALUATION SCHEME

A. Evaluation for Mandatory Theory Courses (4 Credit Courses)

I. Internal Evaluation for Mandatory Theory Courses – 50 Marks

(i) Mid-Term Class Test – 30 Marks

(ii) Assignment/ Case study– 20 Marks

OR

(i) SWAYAM (Advanced Course) of minimum 20 hours and certification exam completed – 50 Marks

OR

(ii) NPTEL (Advanced Course) of minimum 20 hours and certification exam completed - 50 Marks

OR

(iii) Valid International Certifications (Prometric, Pearson, Certiport, Coursera, Udemy and the like) - 50 Marks

One certification marks shall be awarded one course only. For four courses, the students will have to complete four certifications.

II. External Examination for Mandatory Theory Courses – 50 Marks

- Duration: **2.0 Hours**
- Theory question paper pattern:

	All questions are compulsory.		
Question	**Based on**	**Options**	**Marks**
Q.1	Unit I	*Any 2 out of 4*	10
Q.2	Unit II	*Any 2 out of 4*	10
Q.3	Unit III	*Any 2 out of 4*	10
Q.4	Unit IV	*Any 2 out of 4*	10
Q.5	Unit I, II,III & IV	*Any 2 out of 4*	10

B. Evaluation for Elective Theory Courses (2 Credit Courses)

I. Internal Evaluation for Elective Theory Courses – 25 Marks

(i) Mid-Term Class Test – 15 Marks

(ii) Assignment/ Case study– 10 Marks

II. External Examination for Elective Theory Courses – 25 Marks

- Duration: **1 Hour**
- Theory question paper pattern:

	All questions are compulsory.		
Question	**Based on**	**Options**	**Marks**
Q.1	Unit I	*Any 2 out of 4*	10
Q.2	Unit II	*Any 2 out of 4*	10
Q.3	Unit I & II	*Any 1 out of 2*	5

C. Evaluation for Mandatory & Elective Practical Courses (2 Credit Courses)

- Each Practical Course carries 50 Marks
  - **40 marks + 05 marks (journal) + 05 marks (viva)**
- Duration: **2 Hours** for each practical course.
- Minimum **80% practical** from each core subjects are required to be completed.
- Certified Journal is compulsory for appearing at the time of Practical Exam

D. Evaluation of On Job Training Course (4 Credit Course)

Internal Evaluation	
Online diary	25
Mid-term interaction	25
Total	**50**
External Evaluation	
OJT Documentation	25
Quality & Relevance	10
OJT Viva	15
Total	**50**

Letter Grades and Grade Points

Semester GPA/ Program CGPA Semester/Program	% of Marks	Alpha-Sign / Letter Grade Result
9.00-10.00	90.0-100	O (Outstanding)
8.00-<9.00	80.0-<90.0	A+ (Excellent)
7.00-<8.00	70.0-<80.0	A (Very Good)
6.00-<7.00	60.0-<70	B+ (Good)
5.50-<6.00	55.0-<60.0	B (Above Average)
5.00-<5.50	50.0-<55.0	C (Average)
4.00-<5.00	40.0-<50.0	P (Pass)
Below 4.00	Below 40	F (Fail)
Ab (Absent)	-	Absent

Scheme of Examination for Theory Courses

There will be an internal and external examination for the theory courses. The weightage of internal/external and scheme of examination will be as per common guidelines provided by the University for the PG courses in the faculty of Science.

Scheme of Examination for Practical Courses

There will not be any internal examination for practical courses.

Documents required: Students should scan & upload all the required documents in Original.

Photo & Signature has to be scan during the Registration process

Part- I: - M.Sc. (I. T.) / Computer Science

Documents required for admission to the old students of CDOE

1. **Original mark sheet of First year and in case of more than one attempt student should upload first and last mark sheet of the respective class.**
2. **Previous year Identity Card.**
3. **Marriage Certificate/ Gazette Notification (for female married students) in case of name change of the student**

Documents required for the students from affiliated colleges of University of Mumbai

1. **Original mark sheet of first year and in case of more than one attempt student should upload first and last mark sheet of the respective class**
2. **Marriage Certificate/ Gazette Notification (For female married students) in case of name change of the student.**

Documents required:

Photo & Signature has to be scan & upload during the Registration process

Part- II: - M.Sc. (I. T.) / Computer Science
Documents required for admission to the old students of CDOE

1. **Original mark sheet of First year and in case of more than one attempt**

   student should scan & upload first and last mark sheet of the respective class.
2. **Previous year Identity Card.**
3. **Convocation certificate**
4. **Marriage Certificate/ Gazette Notification (for female married students) in case of name change of the student**

Documents required for the students from affiliated colleges of University of Mumbai

1. **Original mark sheet of first year and in case of more than one attempt student Should scan & upload first and last mark sheet of the respective class.**
2. **No Objection Certificate from the last attended college**
3. **Convocation certificate**
4. **Marriage Certificate/ Gazette Notification (For female married students) in case of name change of the student**

Documents required:

Documents required for admission for all students of other universities (Applicable only for Part-I of M.Sc. (I. T.)/ Computer Science)

ELIGIBILITY CRITERIA

INSTRUCTIONS FOR ELIGIBILITY CASE STUDENTS: -

The students from CBSE, ICSE, DIPLOMA from MSBTE/other state, NIOS, HSC Boards other than Maharashtra State, IB, CIE, D. ED and Degree from other than University of Mumbai will have to obtain the Eligibility Certificate which will be issued online after approval from Eligibility Unit, Room No. 108 (A), Centre for Distance and Online Education, Dr. Shankar Dayal Sharma Bhavan, Vidyanagari, Santacruz (E), Mumbai-400 098.

Migration certificate in original shall be submitted within 2 months from date of admission in respective Department of CDOE.

Equivalence certificate shall be submitted by the students wherever required.

Note: - The students who have passed 3/4yr Bachelor's Degree from other University and completed another degree course viz. B. ED, L.L.B., MMS etc. form college affiliated to University of Mumbai

and wish to pursue M.A./M.COM/M.Sc./MCA from the University of Mumbai are required to obtain Eligibility Certificate from University of Mumbai, CDOE. Such students should submit their Eligibility 9 Confirmation letter from the earlier College / Institute affiliated to Mumbai University from where he / she has passed B.Ed. /LLB/ MMS / etc.

REQUIRED DOCUMENTS FOR OBTAINING ELIGIBILITY CERTIFICATE:

1. S.S.C. and onwards all examination (F.Y., S.Y. & T.Y.)

2. Equivalent Certificate from MSBTE/Tech Board of the concern state (in case of diploma students)

3. Passing/ Convocation/ Degree Certificate

4. Marriage Certificate/ Gazette Notification (For female married students)

5. Migration / Transfer Certificate (shall be submitted within 2 months)

FEES FOR ELIGIBILITY CASE:

Document Verification fees of Rs. 400/- will be charged from UG/PG programmes students who have passed their Board/ University Examinations from other than Maharashtra State Higher Secondary Board / other than University of Mumbai (Only for Eligibility Case).

Eligibility fees of Rs. 220/- for the students who have passed their examination from Maharashtra State Universities and Diploma from MSBTE and Rs. 320/- for out of Maharashtra State Universities /Boards other than Maharashtra /Technical Boards of other State.

ELIGIBILITY CRITERIA

INSTRUCTIONS FOR ELIGIBILITY CASE STUDENTS: -

The students from CBSE, ICSE, DIPLOMA from MSBTE/other state, NIOS, HSC Boards other than Maharashtra State, IB, CIE, D. ED and Degree from other than University of Mumbai will have to obtain the Eligibility Certificate which will be issued online after approval from Eligibility Unit, Room No. 108 (A),Centre for Distance and Online Education, Dr. Shankar Dayal Sharma Bhavan, Vidyanagari, Santacruz (E), Mumbai-400 098.

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Note: - The students who have passed 3/4yr Bachelor's Degree from other University and completed another degree course viz. B. ED, L.L.B., MMS etc. form college affiliated to University of Mumbai and wish to pursue M.A./M.COM/M.Sc./MCA from the University of Mumbai are required to obtain Eligibility Certificate from University of Mumbai, CDOE. Such students should submit their Eligibility 9 Confirmation

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3.5 M. Sc. (Information Technology)-(Based on NEP 2020)

Title of the program : B- M.Sc. (Information Technology) (Two Year)

Syllabus for Semester – Sem I & II Ref: GR dated 16th May, 2023 for Credit Structure of PG.

Year	Level		Major		Electives	RM	OJT/FP	RP	Cum. CR	Degree
		Mandatory		4	4					
		2*4+2*2+2								
		Data Science(501)	TH	4	Security breaches andcountermeasures(506a)PR					
		Data Science Practical(502)	PR	2						
		Soft Computing Techniques(503)	TH	4						
		Soft Computing Techniques practical(504)	PR	2	OR					
		Cloud Comuting(505)	TH	2	Image Processing(506c)	Research Methodogy(510)	_	_	22	
		2*4+2*2+2								PG Diplon
		Big Data analytics(511)	TH	4	Malware Analysis(PR)(516a)					
		Big Data analytics(512)	PR	2						
		Modern Networkings(513)	TH	4						
		Modern Networkings(514)	PR	2	OR					
I	6	Microservices architecture(515)	TH	2	Computer Vision(PR)(516c)	Research Methodogy(510)	_	(517)4	22	
um Cr For PG Diplom		28	8	4	4	4				

Syllabus Link: [6.29-N-M.Sc.-Information-Technology-Sem.-I-II.pdf (mu.ac.in)]

Theory courses of 4 credits: Total marks 100. Out of the total, 50 % each for internal and external evaluation.

A. Internal Evaluation (30m + 10m + 10m = 50 Marks)

The internal assessment marks shall be awarded as follows:

1. 30 marks (Any one of the following):

a. Written Test of 30 Marks

b. SWAYAM (Advanced Course) of minimum 20 hours and certification exam completed or c. NPTEL (Advanced Course) of minimum 20 hours and certification exam completed or

d. Valid International Certifications (Prometric, Pearson, Certiport, Coursera, Udemy and the like)

e. Certification marks of one completed exam shall be awarded to one course only. For four courses, the students will have to complete four certifications.

(Note: Only those certification/courses suggested by the department shall be deemed valid, Student cannot do any certification on their own)

2. 10 marks 10 marks from every course (Two 4 credits mandatory courses, one 2 credits mandatory course, one 4 credits elective course) coming to a total of 40 marks, shall be awarded on publishing of research paper in UGC approved / Other Journal with plagiarism less than 15%. The marks can be awarded as per the impact factor of the journal, quality of the paper, importance of the contents published, social value.

3. 10 marks Open Book examination based on problem solving related to the respective subject.

i. Suggested format of Question paper of 30 marks for the written test.

Q1.	Attempt *any two* of the following:	16 marks
a.		
b.		
c.		
d.		
Q2.	Attempt *any two* of the following:	14 marks
a.		
b.		
c.		
d.		

B. External Examination: (50 marks) Duration : 2 hrs

	All questions are compulsory	
Q1	(Based on all units) Attempt *any two* of the following:	10 marks
a.	Unit 1	
b.	Unit 2	
c.	Unit 3	
d.	Unit 4	
Q2	(Based on Unit 1) Attempt *any two* of the following:	10 marks
Q3	(Based on Unit 2) Attempt *any two* of the following:	10 marks
Q4	(Based on Unit 3) Attempt *any two* of the following:	10 marks
Q5	(Based on Unit 4) Attempt *any two* of the following:	10 marks

Theory courses of 2 credits: Total marks 50.

Out of the total, 50 % each for internal and external evaluation.

A. Internal Evaluation (25 Marks):

The internal assessment marks shall be awarded as follows:

1. 10 marks from every course (Two 4 credits mandatory courses, One 2 credits mandatory course, One 4 credits elective course) coming to a total of 40 marks, shall be awarded on publishing of research paper in UGC approved / Other Journal with plagiarism less than **15%.** The marks can be awarded as per the impact factor of the journal, quality of the paper, importance of the contents published, social value.

2. 10 marks - Open Book examination based on problem solving related to the respective subject.

3. 5 marks - Assignment/Group discussion.

B. **External Examination: (25 marks) Duration : 1 hr**

	All questions are compulsory	
Q1	(Based on Unit 1) Attempt *any two* of the following:	13 marks
Q2	(Based on Unit 2) Attempt *any two* of the following:	12 marks

Practical courses of 2 credits: Total marks 50. Out of the total, 50 % each for internal and external evaluation.

A. **Practical Evaluation Internal (25 marks)**

1.	Performance during all practical sessions	10
2.	Problem solving with the acquired programming skills	10
3.	Viva Voce	5

B. **Practical Evaluation External (25 marks)**

A Certified copy of hard-bound journal is essential to appear for the practical examination.

1.	Practical Question	15
2.	Journal	5
3.	Viva Voce	5

Letter Grades and Grade Points

Semester GPA/Program CGPA Semester/Program	**Percentage of Marks**	**Alpha-Sign/Letter Grade Result**
9.00 – 10.00	90.00-100.00	O (Outstanding)
8.00 -<9.00	80.00-<90.00	A+ (Excellent)
7.00-<8.00	70.00-<80.00	A (Very Good)
6.00-<7.00	60.00-<70.00	B+ (Good)
5.50-<6.00	55.00-<60.00	B (Above Average)
5.00-<5.50	50.00-<55.00	C (Average)
4.00-<5.00	40.00-<50.00	P (Pass)
Below 4.00	Below 40.00	F (Fail)
Ab(Absent)	-	Absent

Semester – Sem.- III & IV Ref: GR dated 16th May, 2023 for Credit Structure of PG (With effect from the academic year 2025-26)

<table>
<tr><th>Year</th><th>Level</th><th>Sem(2yr)</th><th colspan="4">Major</th><th>RM</th><th>OJT/FP</th><th>RP</th><th>Cum. Cr.</th><th>Degree</th></tr>
<tr><td rowspan="11">2</td><td rowspan="11">6.5</td><td rowspan="6">Sem III</td><td colspan="3">2*4+2*2+2</td><td>4</td><td rowspan="6">-</td><td rowspan="6">-</td><td rowspan="6">(607)4</td><td rowspan="6">22</td><td rowspan="16">PG Degree after 3yr UG or PG Degree after 4yr UG</td></tr>
<tr><td>Advanced AI (601)</td><td>TH</td><td>4</td><td rowspan="5">Security Operations Center (PR) (606b)</td></tr>
<tr><td>Advanced AI Practical (602)</td><td>PR</td><td>2</td></tr>
<tr><td>Machine Learning (603)</td><td>TH</td><td>4</td></tr>
<tr><td>Machine Learning Practical (604)</td><td>PR</td><td>2</td></tr>
<tr><td>Storage as a Service (605)</td><td>TH</td><td>2</td></tr>
<tr><td rowspan="5">Sem IV</td><td colspan="3">2*4+2*2</td><td>4</td><td rowspan="5">-</td><td rowspan="5">-</td><td rowspan="5">(616)6</td><td rowspan="5">22</td></tr>
<tr><td>Blockchain (611)</td><td>TH</td><td>4</td><td rowspan="4">Cyber Forensics (PR) (615b)</td></tr>
<tr><td>Blockchain Practical (612)</td><td>PR</td><td>2</td></tr>
<tr><td>Deep Learning (613)</td><td>TH</td><td>4</td></tr>
<tr><td></td><td></td><td></td><td>Deep Learning Practical (614)</td><td>PR</td><td>2</td></tr>
<tr><td colspan="3">Cum. Cr. For 1 Yr PG Degree</td><td colspan="3">26</td><td>8</td><td></td><td></td><td>10</td><td>44</td></tr>
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</table>

Syllabus Link:

Theory courses of 4 credits: Total marks 100. Out of the total, 50 % each for internal and external evaluation.

A. Internal Evaluation (30m + 10m + 10m = 50 Marks)

The internal assessment marks shall be awarded as follows:

1. 30 marks (Any one of the following):

a. Written Test of 30 Marks

b. SWAYAM (Advanced Course) of minimum 20 hours and certification exam completed or c. NPTEL (Advanced Course) of minimum 20 hours and certification exam completed or

d. Valid International Certifications (Prometric, Pearson, Certiport, Coursera, Udemy and the like)

e. Certification marks of one completed exam shall be awarded to one course only. For four courses, the students will have to complete four certifications.

(Note: Only those certification/courses suggested by the department shall be deemed valid, Student cannot do any certification on their own)

2. 10 marks 10 marks from every course (Two 4 credits mandatory courses, one 2 credits mandatory course, one 4 credits elective course) coming to a total of 40 marks, shall be awarded on publishing of research paper in UGC approved / Other Journal with plagiarism less than 15%. The marks can be awarded as per the impact factor of the journal, quality of the paper, importance of the contents published, social value.

3. 10 marks Open Book examination based on problem solving related to the respective subject.

i. Suggested format of Question paper of 30 marks for the written test.

Q1.	Attempt *any two* of the following:	16 marks
a.		
b.		
c.		
d.		
Q2.	Attempt *any two* of the following:	14 marks
a.		
b.		
c.		
d.		

B. External Examination: (50 marks) Duration : 2 hrs

	All questions are compulsory	
Q1	(Based on all units) Attempt *any two* of the following:	10 marks
a.	Unit 1	
b.	Unit 2	
c.	Unit 3	
d.	Unit 4	
Q2	(Based on Unit 1) Attempt *any two* of the following:	10 marks
Q3	(Based on Unit 2) Attempt *any two* of the following:	10 marks
Q4	(Based on Unit 3) Attempt *any two* of the following:	10 marks
Q5	(Based on Unit 4) Attempt *any two* of the following:	10 marks

Theory courses of 2 credits: Total marks 50.

Out of the total, 50 % each for internal and external evaluation.

A. Internal Evaluation (25 Marks):

The internal assessment marks shall be awarded as follows:

1. 10 marks from every course (Two 4 credits mandatory courses, One 2 credits mandatory course, One 4 credits elective course) coming to a total of 40 marks, shall be awarded on publishing of research paper in UGC approved / Other Journal with plagiarism less than **15%.** The marks can be awarded as per the impact factor of the journal, quality of the paper, importance of the contents published, social value.

2. 10 marks - Open Book examination based on problem solving related to the respective subject.

3. 5 marks - Assignment/Group discussion.

B. **External Examination: (25 marks) Duration : 1 hr**

	All questions are compulsory	
Q1	(Based on Unit 1) Attempt *any two* of the following:	13 marks
Q2	(Based on Unit 2) Attempt *any two* of the following:	12 marks

Practical courses of 2 credits: Total marks 50. Out of the total, 50 % each for internal and external evaluation.

A. **Practical Evaluation Internal (25 marks)**

1.	Performance during all practical sessions	10
2.	Problem solving with the acquired programming skills	10
3.	Viva Voce	5

B. **Practical Evaluation External (25 marks)**

A Certified copy of hard-bound journal is essential to appear for the practical examination.

1.	Practical Question	15
2.	Journal	5
3.	Viva Voce	5

Letter Grades and Grade Points

Semester GPA/Program CGPA Semester/Program	**Percentage of Marks**	**Alpha-Sign/Letter Grade Result**
9.00 – 10.00	90.00-100.00	O (Outstanding)
8.00 -<9.00	80.00-<90.00	A+ (Excellent)
7.00-<8.00	70.00-<80.00	A (Very Good)
6.00-<7.00	60.00-<70.00	B+ (Good)
5.50-<6.00	55.00-<60.00	B (Above Average)
5.00-<5.50	50.00-<55.00	C (Average)
4.00-<5.00	40.00-<50.00	P (Pass)
Below 4.00	Below 40.00	F (Fail)
Ab(Absent)	-	Absent

For the M.Sc.I.T.-Part-2, academic Year 2024-25 CDOE is providing selected subjects from selected track:(Study Material Available)

Artificial Intelligence Track
Cloud Computing Track
Security Track

Semester III

Course code	Theory	Credit	Course code	Practical	Credit
PSIT301	Technical Writing and Entrepreneurship Development	4	PSIT3P1	Project Documentation and Viva	2
PSIT303a	Machine Learning	4	PSIT3P3a	Machine Learning Practical	2
PSIT302c	Cloud Application Development	4	PSIT3P2c	Cloud Application Development Practical	PSIT302 c
PSIT304d	Offensive Security	4	PSIT3P4d	Offensive Security Practical	2
	Total Theory Credits	16		Total Practical Credits	8
Total Credits for Semester III: 24					
Semester IV					
Course Code		Theory Credits	Course Code		Practical Credit
PSIT401	Blockchain	4	PSIT4P1	Blockchain Practical	2
PSIT403a	Deep Learning	4	PSIT4P2a	Deep Learning Practical	2
PSIT402d	Cyber Forensics	4	PSIT4P2d	Cyber Forensics Practical	2
PSIT404c	Storage as a Service	4	PSIT4P4	Project Implementation and Viva	2
	Total Theory Credits	16		Total Practical Credits	8
Total Credits for Semester IV: 24					

Syllabus: https://mu.ac.in/wp-content/uploads/2020/12/4.100.-M.Sc.I.T.-Part-2-Syllabus-2020-2021_Annexure-I.pdf

Note:

Evaluation Scheme Internal Evaluation (25 Marks)

The internal assessment marks shall be awarded as follows:

1. 5 marks (Any one of the following):

a. Written Test or

b. SWAYAM (Advanced Course) of minimum 20 hours and certification exam completed or

c. NPTEL (Advanced Course) of minimum 20 hours and certification exam completed or

d. Valid International Certifications (Prometric, Pearson, Certiport, Coursera, Udemy and the like)

e. One certification mark shall be awarded one course only.

For four courses, the students will have to complete four certifications.

2. 10 marks The marks given out of 25 (15 in Semester 4)

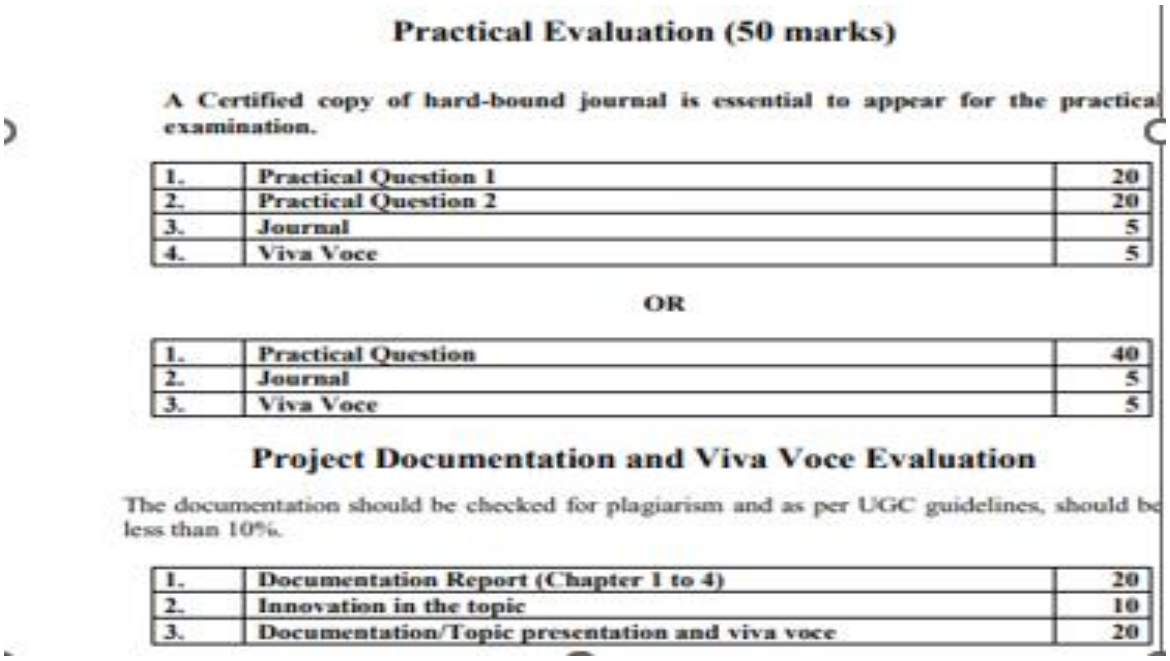
for publishing the research paper should be divided into four courses and should be awarded out of 10 in each of the four courses.

ii. 10 marks from every course coming to a total of 40 marks, shall be awarded on publishing of research paper in UGC approved / Other Journal with plagiarism. Less than 10%. The marks can be awarded as per the impact factor of the journal, quality of the paper, importance of the contents published, social value.

External Examination: 75 Marks

	All questions are Compulsory	
Q1	(Based on Unit 1) Attempt any three of the following a._____ b_____ c_____ d_____ e_____	15 marks
Q2	(Based on Unit 2) Attempt any three of the following	15 marks
Q3	(Based on Unit 3) Attempt any three of the following	15 marks

Q4	(Based on Unit 4) Attempt any three of the following	15 marks
Q5	(Based on Unit 5) Attempt any three of the following	15 marks



Practical Evaluation (50 marks)

A Certified copy of hard-bound journal is essential to appear for the practical examination.

1.	Practical Question 1	20
2.	Practical Question 2	20
3.	Journal	5
4.	Viva Voce	5

OR

1.	Practical Question	40
2.	Journal	5
3.	Viva Voce	5

Project Documentation and Viva Voce Evaluation

The documentation should be checked for plagiarism and as per UGC guidelines, should be less than 10%.

1.	Documentation Report (Chapter 1 to 4)	20
2.	Innovation in the topic	10
3.	Documentation/Topic presentation and viva voce	20

1.	Documentation Report (Chapter 5 to last)	20
2.	Implementation	10
3.	Relevance of the topic	10
4.	Viva Voce	10

Appendix – 1 Project Documentation and Viva-voce (Semester III) and Project Implementation and Viva-Voce (Semester IV)

Goals of the course Project Documentation and Viva-Voce

The student should:

- be able to apply relevant knowledge and abilities, within the main field of study, to a given problem .
- within given constraints, even with limited information, independently analyze and discuss complex inquiries/problems and handle larger problems on the advanced level within the main field of study
- reflect on, evaluate and critically review one's own and others' scientific results
- be able to document and present one's own work with strict requirements on structure, format, and language usage.

- be able to identify one's need for further knowledge and continuously develop one's own knowledge.

To start the project:

Start thinking early in the programme about suitable projects.

Read the instructions for the project.

- Attend and listen to other students' final oral presentations.
- Look at the finished reports.
- Talk to senior master students.
- Attend possible information events (workshops / seminars / conferences etc.) about the related topics.

Application and approval:

- Read all the detailed information about the project.
- Finalize finding a place and supervisor.
- Check with the coordinator about the subject/project, place and supervisor.
- Write the project proposal and plan along with the supervisor.
- Fill out the application together with the supervisor.
- Hand over the complete application, proposal and plan to the coordinator.
- Get an acknowledgement and approval from the coordinator to start the project.

Get an acknowledgement and approval from the coordinator to start the project.

During the project:

- Search, gather and read information and literature about the theory.
- Document well the practical work and your results.
- Take part in seminars and the running follow-ups/supervision.
- Think early on about disposition and writing of the final report.
- Discuss your thoughts with the supervisor and others.
- Read the SOP and the rest you need again.
- Plan for and do the mid-term reporting to the coordinator/examiner.
- Do a mid-term report also at the work-place (can be a requirement in some work-places).
- Write the first draft of the final report and rewrite it based on feedback from the supervisor and possibly others.
- Plan for the final presentation of the report..

Finishing the project:

- Finish the report and obtain an OK from the supervisor.
- Ask the supervisor to send the certificate and feedback form to the coordinator.
- Attend the pre-final oral presentation arranged by the Coordinator.
- Rewrite the final report again based on feedback from the opponents and possibly others.
- Prepare a title page and a popular science summary for your report.
- Send the completed final report to the coordinator (via plagiarism software).
- Rewrite the report based on possible feedback from the coordinator.
- Appear for the final exam.

Project Proposal/research plan

- The student should spend the first 1-2 weeks writing a 1-2 pages project plan containing:
- - Short background of the project - Aims of the project
- - Short description of methods that will be used
- - Estimated time schedule for the project
- The research plan should be handed in to the supervisor and the coordinator.
- Writing the project plan will help you plan your project work and get you started in finding information and understanding of methods needed to perform the project.

Project Documentation

The documentation should contain:

- The student should spend the first 1-2 weeks writing a 1-2 pages project plan containing:
  - Short background of the project
  - Aims of the project - Short description of methods that will be used
  - Estimated time schedule for the project The research plan should be handed in to the supervisor and the coordinator.
- Writing the project plan will help you plan your project work and get you started in finding information and understanding of methods needed to perform the project.

For the master's documentation, the chapters cannot be dictated, they may vary according to the type of project.

However, in Semester III Project Documentation and Viva Voce must contain at least 4 chapters (Introduction, Review of Literature, Methodology / Approach, Proposed Design / UI design, etc. depending on the type of project.)

The Semester III report should be spiral bound.

In Semester IV, the remaining Chapters should be included (which should include Experiments performed, Results and discussion, Conclusions and proposals for future work, Appendices) and Bibliography - references and links.

Semester IV report should include all the chapters and should be hardbound.

STANDARD OF PASSING: - (M.Sc. Computer Science)

1. In 80:20 Scheme of examination, every paper and practical is considered as separate head of passing.
2. Minimum passing marks require in every head is 40% (theory as well as in practical).
3. To pass the examination the student must secure minimum 30 marks out of 75 marks in each theory paper separately
4. For practical component, student needs to score minimum 20 marks out of 50 marks in each practical.
5. Project has 100 marks and student need to score minimum 40% marks for passing.

Documents required: Students should scan & upload all the required documents in Original.

Photo & Signature has to be scan during the Registration process

Part- I: - M.Sc. (I. T.) / Computer Science.

Documents required for admission to the old students of CDOE

1. Original mark sheet of First year and in case of more than one attempt student should upload first and last mark sheet of the respective class.
2. Previous year Identity Card.
3. Marriage Certificate/ Gazette Notification (for female married students) in case of name change of the student

Documents required for the students from affiliated colleges of University of Mumbai

1. Original mark sheet of first year and in case of more than one attempt student should upload first and last mark sheet of the respective class
2. Marriage Certificate/ Gazette Notification (For female married students) in case of name change of the student.

Documents required:

Photo & Signature has to be scan & upload during the Registration process

Part- II: - M.Sc. (I. T.) / Computer Science.

Documents required for admission to the old students of CDOE

1. Original mark sheet of First year and in case of more than one attempt student should scan & upload first and last mark sheet of the respective class.
2. Previous year Identity Card.
3. Convocation certificate
4. Marriage Certificate/ Gazette Notification (for female married students) in case of name change of the student

Documents required for the students from affiliated colleges of University of Mumbai

1. Original mark sheet of first year and in case of more than one attempt student should scan & upload first and last mark sheet of the respective class.

2. No Objection Certificate from the last attended college.
3. Convocation certificate
4. Marriage Certificate/ Gazette Notification (For female married students) in case of name change of the student

Documents required:

Documents required for admission for all students of other universities (Applicable only for Part- I of M.Sc. (I. T.)/ Computer Science)

INSTRUCTIONS FOR ELIGIBILITY CASE STUDENTS: -

The students from CBSE, ICSE, DIPLOMA from MSBTE/other state, NIOS, HSC Boards other than Maharashtra State, IB, CIE, D. ED and Degree from other than University of Mumbai will have to obtain the Eligibility Certificate which will be issued online after approval from Eligibility Unit, Room No. 108 (A), Centre for Distance and Online Education, Dr. Shankar Dayal Sharma Bhavan, Vidyanagari, Santacruz (E), Mumbai-400 098.

Migration certificate in original shall be submitted within 2 months from date of admission in respective Department of CDOE.

Equivalence certificate shall be submitted by the students wherever required.

Note: - The students who have passed 3/4yr Bachelor's Degree from other University and completed another degree course viz. B. ED, L.L.B., MMS etc. form college affiliated to University of Mumbai and wish to pursue M.A./M.COM/M.Sc./MCA from the University of Mumbai are required to obtain Eligibility Certificate from University of Mumbai, CDOE. Such students should submit their Eligibility 9 Confirmation letter from the earlier College / Institute affiliated to Mumbai University from where he / she has passed B.Ed. /LLB/ MMS / etc.

REQUIRED DOCUMENTS FOR OBTAINING ELIGIBILITY CERTIFICATE:

1. S.S.C. and onwards all examination (F.Y., S.Y. & T.Y.)

2. Equivalent Certificate from MSBTE/Tech Board of the concern state (in case of diploma students)

3. Passing/ Convocation/ Degree Certificate

4. Marriage Certificate/ Gazette Notification (For female married students)

5. Migration / Transfer Certificate (shall be submitted within 2 months)

FEES FOR ELIGIBILITY CASE:

Document Verification fees of Rs. 400/- will be charged from UG/PG program students who have passed their Board/ University Examinations from other than Maharashtra State Higher Secondary Board / other than University of Mumbai (Only for Eligibility Case).

Eligibility fees of Rs. 220/- for the students who have passed their examination from Maharashtra State Universities and Diploma from MSBTE and Rs. 320/- for out of Maharashtra State Universities /Boards other than Maharashtra /Technical Boards of other State.

DETAILS OF PROGRAMMES IN FACULTY OF TECHNOLOGY

3.6 Master of Computer Application Course (MCA)

Two year (Four semesters) Post Graduate Programme

MCA – SEM I & SEM II (Revised 2020-21)

Semester I

Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract & oral	Total
		Internal Assessment			End Sem. Exam	Exam. Duration (in Hrs)			
		CA	Test	Avg					
MCA11	Mathematical Foundation for Computer Science 1	20	20	20	80	3	25	--	125
MCA12	Advanced Java	20	20	20	80	3	--	--	100
MCA13	Advanced Database Management System	20	20	20	80	3	--	--	100
MCA14	Software Project Management	20	20	20	80	3	25	--	125
MCAL11	Data Structures Lab with C and / C++	--	--	--	--	--	50	50	100
MCAL12	Advanced Java LAB	--	--	--	--	--	25	50	75
MCAL13	Advanced Database Management System LAB	--	--	--	--	--	25	50	75
MCAL14	Web Technologies	--	--	--	--	--	50	50	100
MCAP11	Mini Project – 1 A	--	--	--	--	--	50	--	50
Total		**--**	**--**	**80**	**320**	--	**250**	**200**	**850**

Semester II

Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract & oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		CA	Test	Avg.					
MCA21	Mathematical Foundation for Computer Science 2	20	20	20	80	3	25	--	125
MCA22	Artificial Intelligence and Machine Learning	20	20	20	80	3	--	--	100
MCA23	Information Security	20	20	20	80	3	--	--	100
MCAE24	Elective - 1	20	20	20	80	3	--	--	100
MCAE25	Elective – 2	20	20	20	80	3	25	--	125
MCAL21	Artificial Intelligence and Machine Learning Lab	--	--	--	--	--	25	50	75
MCAL22	Soft Skill Development Lab	--	--	--	--	--	50	--	50
MCALE23	Elective 1 Lab	--	--	--	--	--	25	50	75
MCAL24	Skill based Lab Course AWT Lab	--	--	--	--	--	50	50	100
MCAL25	Skill based Lab Course User Interface Lab	--	--	--	--	--	25	50	75
MCAL26	Skill based Lab Course Networking with Linux Lab	--	--	--	--	--	25	50	75
MCAP21	Mini Project 1-B	--	--	--	--	--	50	--	50
Total		--	--	**100**	**400**	--	**300**	**250**	**1050**

Elective 1

Sr. No	Course Code	Course Name	Lab Course Code
1	MCAE241	Image Processing	MCALE231

Elective 2

Sr. No	Course Code	Course Name
1	MCAE251	Natural Language Processing

SECOND YEAR M.C.A. SEMESTER III & IV

Semester III

Elective 3

Sr. No.	Course Code	Course Name	Lab Course Code
1	MCAE334	Ethical Hacking	MCALE334

Elective 4

Sr. No.	Course Code	Course Name
1	MCAE343	Management Information System

N.B.: - ASSIGNMENT SUBMISSION

1. Students are required to submit their respective term works/assignments at their respective Learner Support centers.

2. Internal assessment of Tutorials to be done separately and term work marks to be given out of 25 for those courses where tutorial is mentioned.

Semester IV

Course Code	Course Name	Teaching Scheme (Contact Hours)		Credits Assigned		
		Theory	Pract.	Theory	Pract.	Total
MCAI41	Internship	--	40	--	15	15
MCAR42	Research Paper	1	--	1	--	1
MCAM43	Online Course- (MOOC)	4#	--	4	--	4!
MCAS44	Institute Social Responsibility*	--	--	--	--	2*
Total		**5**	**40**	**5**	**15**	**20+2***

Course Code	Course Name	Examination Scheme			
		Internal Assessment		University Assessment	Total
		Mid term Presentation I	Mid term Presentation II	Final Presentation	
MCAI41	Internship	25	25	200	250
MCAR42	Research Paper	25	25	--	50
Total		**50**	**50**	**200**	**300**

 # Work load only for students
! Credits transferred from MOOC courses
*** Credits allotted in semester IV based on the (ISR) work done in semesters I II III**
Note:
● The Online Course- 1 (MOOC) has to be completed before the completion of the MCA course
(it can be done in the Semester 1 to 4 but to be accounted for in semester 4).

Program Structure for Bridge Course (With Effect from 2020-2021)

For the graduates, not having graduation in Computer Science/Information Technology/ Computer Application, need to complete the bridge course in first year of MCA along with the semester I and II of MCA

Course Code	Course Name	Group	Teaching Scheme (Contact Hours)			Credits Assigned			
			Theory	Pract.	Tut.	Theory	Pract.	Tut	Total
MCABR1	Programming with C++	ICT	3	--	--	--	--	--	--
MCABR2	Data Structures	ICT	3	--	--	--	--	--	--
MCABR3	Operating Systems	ICT	3	--	--	--	--	--	--
MCABR4	Computer Networks	ICT	3	--	--	--	--	--	--
MCABR5	Discrete Mathematics	M	3	--	--	--	--	--	--
	Total		15		--	--	--	--	--

Course Code	Course Name	Group	Examination Scheme							
			Theory					Pract		
			Internal Assessment			End Sem.	Exam. Duration	Pract	Oral	Total
			CA	Test	Avg.		In Hrs			
MCABR1	Programming with C++	ICT	20	20	20	80	3	--	--	100
MCABR2	Data Structures	ICT	20	20	20	80	3	--	--	100
MCABR3	Operating Systems	ICT	20	20	20	80	3	--	--	100
MCABR4	Computer Networks	ICT	20	20	20	80	3	--	--	100
MCABR5	Discrete Mathematics	M	20	20	20	80	3	--	--	100
	Total									500

3.9 Allowed to Keep Terms (ATKT): for two years MCA program

Bridge Course for two years MCA program:

- The graduates, not having graduation in Computer Science/Information Technology/ Computer Application, **need to complete the bridge course in the first year of MCA** along with the Semester I and II of MCA without which s/he will not be promoted to Semester III.
- The syllabus of the Bridge Course is mentioned in the Syllabus (wef 2020-21 – MCA 2 years Programme)

Allowed to Keep Terms (ATKT)for two years MCA program:

1. A learner shall be allowed to keep term for Semester II irrespective of grades obtained in each course of Semester I.

2 a) **For CS/ IT/ CA graduates** :A learner shall be allowed to keep term for Semester III if s/he passes each of Semester I , Semester II

2 b) **For Non CS/ IT/ CA graduates:** A learner shall be allowed to keep term for Semester III if s/he passes each of Semester I , Semester II along with all courses of Bridge courses

OR

S/he fails in not more than five heads of passing of Semester I and Semester II taken together.(Excluding Bridge Course)

3. A learner shall be allowed to keep term for Semester IV irrespective of grades obtained in each course of Semester III.

Note: Grade AB should be considered as failed and treated as one head for deciding

ATKT Note: Even though Term Work is not a separate head of passing, a learner should satisfactorily complete Term Work in all courses for a particular semester as per syllabus/curriculum manual to be eligible to appear for any form of examination.

Standard of passing M.C.A

To pass in the individual subject of each semester examination, a student must obtain a minimum 45 percent of the full marks in (a) theory paper and (b) term work, test and internal assessment separately of that subject.

Those of the students who obtained 45 percent of total marks obtainable in each theory paper, term work, test, class work and internal assessment, as the case may be, taken separately shall be declared to have passed the semester examination. A student who fails in an examination but has passed in any of the

subjects of that examination may at his option be exempted from reappearing for the same at a subsequent attempt and will be declared to have passed the relevant semester examination when he has passed in the remaining subjects.

Award of the classes

Those students who obtain (i) 60 percent of marks on the aggregate of the FirstYear, Second Year examination taken together will be placed in the First Class, (ii) 70 per cent marks on the aggregate will be declared to have passed the examination with first class with Distinction and (iii) 50 per cent marks on the aggregate will be declared to have passed the examination in the Second Class.

Documents required: Students should scan & upload all the required documents in Original.

Photo & Signature has to be scanned during the Registration process

First Year: - M.C.A

Documents required for admission to the old students of CDOE

4. Original mark sheets of First, Second & Third year of Degree examination and in case of more than one attempts student should upload first and last mark sheet of the respective class.
5. Mark sheet of HSC or Equivalent
6. Marriage Certificate/ Gazette Notification (for female married students) in case of name change of the student
7. Birth Proof (LC/AADHAR CARD)

Documents required:

Photo & Signature has to be scanned & uploaded during the Registration process

Second Year: - M.C.A

Documents required for admission to the old students of CDOE

5. Original mark sheets of First year and in case of more than one attempts Student should scan & upload first and last mark sheet of the respective class.
6. Previous year Identity Card.
7. Convocation Certificate
8. Marriage Certificate/ Gazette Notification (for female married students) in case of name change of the student.

Documents required:

Documents required for admission for the students of other universities (Applicable only for MCA First Year)

INSTRUCTIONS FOR ELIGIBILITY CASE STUDENTS: -

The students from CBSE, ICSE, DIPLOMA from MSBTE/other state, NIOS, HSC Boards other than Maharashtra State, IB, CIE, D. ED. and Degree from other than University of Mumbai will have to obtain the Eligibility Certificate which will be issued online after approval from Eligibility Unit, Room No. 108 (A), Centre for Distance and Online Education, Dr. Shankar Dayal Sharma Bhavan, Vidyanagari, Santacruz (E), Mumbai-400 098.

Migration certificate in original shall be submitted within 2 months from date of admission in respective Department of CDOE.

Equivalence certificate shall be submitted by the students wherever required.

Note: - The students who have passed 3/4yr Bachelor's Degree from other University and completed another degree course viz. B. ED., L.L.B., and MMS etc. Form College affiliated to University of Mumbai and wish to pursue M.A./M.COM/M.Sc./MCA from the University of Mumbai are required to obtain Eligibility Certificate from University of Mumbai, CDOE. Such students should submit their Eligibility 9 Confirmation letter from the earlier College / Institute affiliated to Mumbai University from where he / she has passed B.Ed. /LLB/ MMS / etc.

REQUIRED DOCUMENTS FOR OBTAINING ELIGIBILITY CERTIFICATE:

1. S.S.C. and onwards all examination (F.Y., S.Y. & T.Y.)

2. Equivalent Certificate from MSBTE/Tech Board of the concern state (in case of diploma students)

3. Passing/ Convocation/ Degree Certificate

4. Marriage Certificate/ Gazette Notification (For female married students)

5. Migration / Transfer Certificate (shall be submitted within 2 months)

FEES FOR ELIGIBILITY CASE:

Document Verification fees of Rs. 400/- will be charged from UG/PG programmes students who have passed their Board/ University Examinations from other than Maharashtra State Higher Secondary Board / other than University of Mumbai (Only for Eligibility Case).

Eligibility fees of Rs. 220/- for the students who have passed their examination from Maharashtra State Universities and Diploma from MSBTE and Rs. 320/- for out of Maharashtra State Universities /Boards other than Maharashtra /Technical Boards of other State.

SECTION-THREE

4. RULES, REGULATIONS, SERVICES AND FACILITIES

4.1 INSTRUCTIONS TO SCHOLARSHIP STUDENTS.

https://mu.ac.in/wp-content/uploads/2024/11/Sholarship-Notice.pdf

4.2 IMPORTANT CIRCULARS & ORDINANCES

https://old.mu.ac.in/distance-open-learning/other-important-circulars-ordinances/

4.5 SELF STUDY TECHNIQUES

As CDOE is offering all the programmes through Distance Education mode, face to face classroom study is not possible here. But it should not be difficult for you to complete the course if you plan your work schedule carefully. If you practice a somewhat systematic way of studying the print materials, much of your job will become easy. We shall give you a few suggestions to make your studies easy and interesting.

We understand that you have many domestic and social commitments to attend to or most of you are from the working category and you may not have ample time for studying. But it is possible to spend some time regularly for your studies. Convince your colleagues and family members that you need some privacy to study and stick to a regular time table. As soon as you receive the study materials start-working on it and don't postpone studying the materials or writing your assignments/responses.

We suggest you should know the techniques of self-study. Your study materials contain a lengthy reading list for reference purpose and for deeper understanding of the content. One strategy that gained wide acceptance is the **SQ3R** technique;

SQ3R stands for the initial letters of the five steps in studying text. The five steps are:

(i) Survey (ii) Question (iii) Read (iv) Recall (v) Review

- **Survey**

Survey refers to the quick glance through the title page, preface, chapter headings, etc. of a textbook.

Surveying a text helps the Students grasp the main ideas.
A glance at the title page may give you:

(i) the general subject area
(ii) the level of approach
(iii) the author's name and
(iv) the date and place of publication

Preface helps you decide whether or not the book deserves your attention. Contents tell you what topics the author is dealing with and how he has organized the themes. An index survey will tell you instantly whether or not the text contains what you need. It also helps you save time and effort by directing you straight to the relevant pages.

- **Question**

Your survey of the text will raise some questions. For example glancing at the title page, preface and contents, you might ask yourself:
How far can I depend on this book? Will the book be helpful to me as its preface suggests? Why should the author devote a whole chapter for such and such a topic?
Having made your survey and started to question, you are now ready for reading the text.

- **Read**

Reading text material demands a critical mind. When we read a text, we apply our mind with all its critical skills. Unless we read actively the questions which have been formulated cannot be answered satisfactorily.

It is not advisable to make notes at this stage. This is not the stage to underline words or phrases either. Keeping these two points in view, what perhaps we can do at the first reading is just to look for the main ideas and the supporting details.

- **Recall**

Reading a text is not the final step in learning. It is, instead, the first step in learning. What is read needs to be recalled for intention. Regular attempts to recall will help improve our learning in three ways
(i) better concentration
(ii) chance to remedy misinterpretation and
(iii) reactive reading. How often to recall chiefly depends on 'how good' a reader you are.

- **Review**

The purpose of reviewing is to check the validity of our recall. The best way to do this is to do a quick repeat of the other four steps i.e. Survey, Question, Read and Recall.

Although the steps of SQ3R are in the logical and natural order there may be overlapping and repetitions between them. Since Distance Learning Students have to work on their own most of the time during their academic career, in this situation, study skills become very important.