PROSPECTUS

2023-24

MASTER OF TECHNOLOGY (M.TECH)

in

Computer Science and Technology

(3 Year, Part Time, Self-Financed)

Department of Computer Science and Technology

University of North Bengal

Raja Rammohunpur, P.O.- NBU, Dist.- Darjeeling, West Bengal

PIN-734013, India

www.nbu.ac.in

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1. SIGNIFICANCE OF PART TIME M.TECH IN COMPUTER SCIENCE AND TECHNOLOGY

The M.Tech programme in Computer Science and Technology is a part time postgraduate programme that enables the aspirants to earn a master's degree in 3 years duration consisting of 6 semesters. If anyone having BE/B.Tech/M.Sc. (Computer Science or Allied Subjects)/MCA degree is a working professional and planning to upgrade his/her career, then this course is best suited for him/her as it will not affect his/her current job schedule and can pursue this course without taking leave from office. This M.Tech programme can be pursued while the candidate is on a job as it is a part-time course that can be attended in the evening after working hours or can even attend the weekend classes (both theory and practical). The idea of bringing the M.Tech part-time course is being taken in accordance with the new AICTE guidelines, which allows all nomenclatures such as part-time, weekend, evening, regular etc. to be dispensed off provided all theoretical and practical classes are held on face to face basis. Considering the importance of technical courses, face to face classes are important for better understanding. It also requires more practical knowledge and, hence, can't be done in distance mode. So, for the aspirants who are unable to attend regular classes or who are **working professionals** can now undergo this part-time M.Tech programme. Students who complete this M.Tech programme from the department may opt for Ph.D. (Tech.) degree from the same department which has also already been proposed by the DC. The proposed course will be of self-financed nature which will help the University to earn additional revenue.

2. PROGRAMME DETAILS

2.1. Title of the Programme

The title of the programme shall be "Master of Technology in Computer Science and Technology" and should be abbreviated as M.Tech (CST).

2.2. Duration of the Programme

The minimum normal duration of the M.Tech programme is 3 year (6 semesters). In special cases, if the student is unable to fulfil the requirements within three years, the BoS may extend the stay for two additional semesters as needed. These students must pay the fees like any other student, re-enrol in the course and complete the course in accordance with the normal requirements.

2.3. Eligibility

The minimum academic eligibility criteria for M.Tech (CST) programme is as follows:

i. B.E./B.Tech (CSE/IT/ECE) or equivalent OR

ii. M.Sc(CS/IT) with PCM at +2 Level OR

iii. MCA with PCM at +2 Level OR

iv. Master Degree holder in Science with Mathematics/Physics/Computer Science/IT/Electronics as one of the subject at PG level and having basic knowledge of Computer Programming.

v. A minimum of 55% marks (or an equivalent grade in a point scale wherever grading system is followed) shall be required at the last qualifying examination (5% relaxation for reserve categories).

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2.4. Seat Matrix

Total Number of Seats: 30

Seat Matrix:

Seat Matrix for Admission to M.Tech (CST) under Dept. of CST, NBU										
Unreserved Categories		Reserved Categories								
Open Category		SC Category		ST Category		OBC A Category		OBC B Category		EWS
Open	Open with PWD	SC	SC with PWD	ST	ST with PWD	OBC-A	OBC-A with PWD	OBC-B	OBC-B with PWD	
12	1	7	0	2	0	3	0	2	0	3

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2.5. Programme And/Or Course Outline

Structure of Proposed Syllabus of Six Semester (3 Year, Part Time, Self-Financed) M.Tech (Computer Science and Technology)							
Year	Semester	Paper Code	Paper Title	Credit	Periods/ Week	Exam. Marks	Continuing Evaluation
	I	CSTC-101	Advanced Data Structures and Algorithms	4	4	70	30
		CSTC-102	Advanced Computer Architecture	4	4	70	30
		CSTC-103	Advanced Data Communication and Computer Networks	4	4	70	30
		CSTL	Data Structures and	2	4	70	30

1st		104	Algorithms Lab using C/C++				
				14	**16**	**280**	**120**
	II	CSTC-201	Real Time Operating Systems	4	4	70	30
		CSTC-202	Advanced RDBMS	4	4	70	30
		CSTE-203	Elective 1 (SWAYAM)	4	4	70	30
		CSTL-204	RDBMS Lab	2	4	70	30
				14	16	280	120
2nd	III	CSTC-301	Selected Topics on Software Engineering	4	4	70	30
		CSTE-302	Elective 2: Data Mining and Data Warehousing Embedded & Real Time Systems Distributed Systems Computational Geometry Open/Swayam Course	4	4	70	30
		CSTE-303	Elective 3: ANN & Pattern Recognition Machine Learning Cryptography & Network Security Big Data Open/Swayam Course	4	4	70	30
		CSTE-304	Elective 4 (SWAYAM)	2	-	70	30
				14	**12**	**280**	**120**
	IV	CSTE-401	Elective 5: Deep Learning Soft Computing Natural Language Processing Design and Operation of Data Centres Open/Swayam Course	4	4	70	30
		CSTE-402	Elective 6: Cloud Computing Parallel Computing Data Storage Technologies Wireless and Mobile Communication Open/Swayam Course	4	4	70	30
		CSTE-403	Elective 7: Cyber Security IoT E-Commerce	4	4	70	30

			Quantum Computing Social Network Analysis Digital Image Processing Open/Swayam Course				
		CSTE-404	Elective 8 (SWAYAM)	2	2	70	30
				14	14	280	120
3rd	V	CSTE-501	Elective 9 (SWAYAM)	4	4	70	30
		CSTE-502	Elective 10 (SWAYAM)	4	4	70	30
		CSTC-503	Project Synopsis	6	6	140	60
				14	**14**	**280**	**120**
	VI	CSTC-601	Dissertation and Defense	8	-	300	-
		CSTC-602	Grand Viva	6	-	-	100
				14	**-**	**300**	**100**
Complete Course				**84**		**2400**	

Detailed syllabus shall be provided separately which shall be updated periodically on recommendation of the Board of Studies and concerned authorities.

2.6. Selection and Admission

Applications for admissions will be invited by the concerned authority through an advertisement in the daily newspapers and University Website as per the University Rules. Merit list will be prepared as per University rules following the below metrics:

S. No.	Particulars	Maximum Marks
1.	Last Qualifying Examination	*10
2.	Valid GATE Score Card or NET/SET/SLET	10
3.	Experience	10 (@ 2 per year in substantive post)
4.	Publications in UGC Care List Journal/Patents	10 (@ 2 per publication/patent)
5.	Publications in Conference Proceedings	10 (@ 1 per publication)
6.	Viva-Voce (during the interview process)	50
	Total	100

*One tenth of the total percentage of marks obtained will be awarded. In case of CGPA/DGPA equivalent conversion will be followed.

Three times the number of vacancies in each category will be called for Viva-Voce initially from the respective merit lists. Subsequent vacant seats will be filled up in the same manner.

The shortlisted candidates will be called for an interview. The selection process will be based on the academic and research criteria as given in the above table along with the performance score in Viva-Voice during interview. Selected candidates will be admitted to Semester-I after completion of the remaining admission procedure. Admission in semesters II to VI will be fulfilled after the conduction of the examinations of the previous semesters.

2.7. Mode of Instruction/Teaching

The mode of instruction/teaching will be blended. Some papers must be taken from SWAYAM; some distinct electives may also be taken from SWAYAM if the students want to take papers other than provided by the department. There will be face-to-face classes in the department after the normal class hours and/or on weekends too. Theory/laboratory classes may be taken as when needed and the students must attend these classes following the attendance criteria of the programme.

2.8. Minimum Requirement for the M.Tech (CST) Degree

To qualify an examination a student has to obtain at least 40% of the total marks in each paper and 50% in aggregate, all other categories and equivalence grades to be assigned following the proposed grading system.

2.9. Declaration of Results, Promotion and Award of Degree

i.   A student will be eligible for promotion to the next higher level if he or she - has cleared all course items of earlier semester individually. - has not been able to clear two course items of current semester and backlog (if any) of the previous semester(s) provided that number of attempts to clear a particular course items do not exceed two.

ii. The student passing the examination will be awarded degree of 3 Year Part Time Master of Technology in Computer Science and Technology, University of North Bengal. The University would publish a list of successful candidates in order of merit.

3. FEES STRUCTURE

The Programme fee includes the following components:

Description	Rs.	Sem-I	Sem-II	Sem-III	Sem-IV	Sem-V	Sem-VI
Admission Fee	Rs.	400	400	400	400	400	400
Tuition Fee	Rs.	20000	20000	20000	20000	20000	20000
Laboratory Fee	Rs.	500	500	500	500	500	500
Library Fee	Rs.	10	10	10	10	10	10

Magazine Fee	Rs.	10	10	10	10	10	10
Session Fee	Rs.	80	80	80	80	80	80
Student's Aid Fund	Rs.	30	30	30	30	30	30
Student's Health Home	Rs.	20	20	20	20	20	20
University Overhead Fee	Rs.	800	900	900	900	900	900
University Development Fee	Rs.	2500	2500	2500	2500	2500	2500
Departmental Development Fee	Rs.	5000	5000	5000	5000	5000	5000
Lab Development Fee	Rs.	500	500	500	500	500	500
Association Fee	Rs.	50	50	50	50	50	50
Identity Card Fee	Rs.	100	0	0	0	0	0
Total:	**Rs.**	**30000**	**30000**	**30000**	**30000**	**30000**	**30000**
Caution Money[*]	Rs.	2000[*]	0	0	0	0	0
Total:	**Rs.**	**32000**	**30000**	**30000**	**30000**	**30000**	**30000**

[*]Caution money is fully refundable only after successful completion of the course.

4. ACADEMIC REQUIREMENTS FOR STUDENTS

4.1. Course Registration

All the candidates taking admission in this course are required to register themselves under University of North Bengal as per the University rules.

4.2. Attendance

Each student shall have to pursue a regular course and attend at least 75% of theoretical and practical classes separately during academic semesters to be eligible to appear in a semester examination. Candidates who have fail in any paper and appear for the same at subsequent chances need not attend the class.

4.3. Course Evaluation and Grading System

Based on the performance in each subject, the student is awarded a grade on a ten-point scale at the end of the semester in each of the enrolled courses.The letter grades, the corresponding grade points and the ratings are as follows:

The Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) shall be calculated as per University rules & regulations as given below:

'O' = Outstanding, 'E' = Excellent, 'A+'= Very Good, 'A'= Good, 'B+'= Average, 'B'= Below Average, 'C+'= Satisfactory, 'C'= Fair, 'F'= Failed.

CGPA & Grading System:

Range of Marks forGrade/Points for each Semester and the entire Course			
Marks in %	Grade (G)	Grade Point (P)	Class
90 and above	O	10	1st Class with
≥ 80 but < 90	E	9	Distinction
≥ 70 but < 80	A+	8	1st Class
≥ 66 but < 70	A	7	2nd Class
≥ 55 but < 66	B+	6	
≥ 50 but < 55	B	5	Pass
< 50	F	0	Fail
Absent	'ab'	0	

Grading system for individual paper		
Marks in %	Grade (G)	Grade Point (P)
90 and above	O	10
≥ 80 but < 90	E	9
≥ 70 but < 80	A+	8
≥ 66 but < 70	A	7
≥ 55 but < 66	B+	6
≥ 50 but < 55	B	5
≥ 45 but < 50	C+	4
≥ 40 but < 45	C	3
< 40	F	0
Absent	'ab'	0

Semester Grade Point Average (SGPA):

On completion of a semester, each student is assigned Semester Grade Point Average (SGPA) which is computed as below for all courses registered by the student during that semester.

$$SGPA = \frac{\sum (C_i \times GP_i)}{\sum C_i}$$

where, C_i is the number of credits for i^{th} course in that semester and GP_i is the grade points earned by the student for that course.

Cumulative Grade Point Average (CGPA):

The overall performance of a student at any stage of the M.Tech programme is evaluated by the Cumulative Grade Point Average (CGPA) upto that point of time.

$$CGPA = \frac{\sum (C_i \times GP_i)}{\sum C_i}$$

where, C_i is the number of credits for i^{th} course in any semester and GP_i is the grade points earned by the student for that course. The summation is over all the courses registered by the student and evaluated during all the semesters up to that point of time, including the failed

courses. The CGPA is rounded off to two decimals. The ranking of the students in a batch at any intermediate or final stage is based on CGPA.

4.4. Scrutiny of Answer Scripts

When the results of the semester are published, if the student feels disappointed, he can request to scrutiny the answers of the semester final exam. For this, the student must submit a request on the prescribed form to the examiner with a fee for scrutiny within five working days after the results are published by the department chair. The answer sheet will be scrutinized by a distinct teacher who shall scrutiny the evaluated answer script. Once the scrutiny is complete, the results will be published and the revised grade will be awarded to the student if there is any change.

4.5. Re-evaluation of Answer Scripts

When the results of the semester are published, if the student feels disappointed, he can request to re-evaluate the answers of the semester final exam. For this, the student must submit a request on the prescribed form to the examiner with a fee for re-evaluation within five working days after the results are published by the department chair. The answer sheet will be shown to the candidate in the presence of the teacher who evaluated the answer script and the relevant department chair. If the candidate wants revaluation after reading the answer book and the marks awarded, it will be done by the chairperson with the faculty who awarded the answer value. Once the revaluation is complete, the results will be published and the revised grade will be awarded to the student. Revaluation will be allowed only for theory-based courses.

4.6. Supplementary Examinations

Any candidate having any back papers in any semester except final semester muster appear the supplementary examination along with the next batch. Only special supplementary examinations for required papers if any will be conducted immediate after the declaration for final semester examination.

4.7. Award of Degree

In order to be eligible to receive the M.Tech degree, all candidates must successfully complete a research oriented Dissertation Work under the supervision of one of the departmental teachers or in any other external organization. In case of external organization,

one of the departmental teachers will act as a co-supervisor. There are three levels of passing, as outlined below:

(i) In order to earn the **M.Tech Degree with Distinction**, a candidate must pass all courses in the first attempt obtaining a CGPA of 9.00 and above in aggregate in the normal duration of three years (extendable up to one more year, provided the extension is officially permitted by the competent authority to take a break during the programme).

(ii) In order to earn an **M.Tech Degree with First Class**, a candidate must pass all courses obtaining a CGPA between 7.00 and 8.99 in aggregate.

(iii) In order to earn an **M.Tech Degree with Second Class**, a candidate must secure a CGPA between 6.00 and 6.99 in aggregate.

(iv) In order to earn an **M.Tech Degree with Pass**, a candidate must secure a CGPA between 5.00 and 5.99 in aggregate.

(v) A candidate securing a CGPA below 5.00 in aggregate treated as **Fail**.

5. CODE OF CONDUCT FOR STUDENTS

5.1. Discontinuation of Studies

For academic, disciplinary or other serious reasons, the appropriate authority will take decision in this regard and the student may be asked to withdraw from the programme in which they are enrolled. A student may also withdraw from a course in which he is enrolled for external reasons. In all these cases, the student loses the fees paid until the end of the relevant academic year, but a transfer document is issued.

5.2. Authenticity of Documents

Students will be expelled if it is found that the information (age, eligibility, etc.) provided by the student during the entire course was deliberately incorrect or falsified. He/She forfeited all the fees he/she had paid until the end of the course. It is the responsibility of the student to verify the validity of all certificates. If such a situation is discovered after the course, the degree issued by the University will be revoked.

5.3. Malpractice and Plagiarism

Any infractions in the lab will be referred to the Disciplinary Committee for appropriate sanctions on assignments and exams. Plagiarism is the practice of calling someone else's idea or work as your own without attribution (acknowledgments or citations). This is also an

academic misconduct and will be dealt with by the Disciplinary Board. When writing theses/dissertation and research papers, students should never reproduce material from published conference or journal articles, textbooks, or other sources such as web documents. It is important to give the most important points from the relevant literature in your own words, rather than copying what someone else has written word for word.

5.4. Ragging

Students are strongly cautioned that any violation of the law is a criminal offense and may result in prosecution and/or punishment as suggested by the appropriate authority.

UNDERTAKING BY THE STUDENT

[To be submitted at the time of admission only]

1. I, _____ (Full Name) a student of semester _____ in _____ (subject), S/o or D/o Mr./Mrs./Ms._____, having been admitted to the University of North Bengal, have received a copy of the UGC Regulations on curbing the menace of Ragging in Higher Educational Institutions, 2009, carefully read and fully understood the provisions contained in the said Regulations.

2. I have, in particular, perused clause 3 of the Regulations and am aware as to what constitutes ragging.

3. I have also, in particular, perused clause 7 and clause 9.1 of the Regulations and am fully aware of the panel and administrative action that is liable to be taken against me in case I am found guilty of or abetting ragging, actively or passively, or being part of a conspiracy to promote ragging.

4. I hereby solemnly aver and undertake that
    a. I will not indulge in any behaviour or act that may be constituted as ragging under clause3 of the Regulations.
    b. I will not participate in or abet or propagate through any act of commission or omission that may be constituted as ragging under clause 3 of Regulations

5. I hereby affirm that, if found guilty of ragging, I am liable for punishment according to clause 9.1 of the Regulations, without prejudice to any other criminal action that may be taken against me under any penal Law or any Law for the time being in force.

6. I hereby declare that I have not been expelled or debarred from admission in any institution in Country on account of being found guilty of, abetting or being part of conspiracy to promote, ragging; and further affirm that, in case the declaration is found to be untrue, I am aware that my admission is liable to be cancelled.

Declared this _____day of _____month of _____year

Signature of deponent

Name:

VERIFICATION

Verified that the contents of this undertaking are true to the best of my knowledge and no part of the undertaking is false and nothing has been concealed or misstated therein.

Verified at_____ on this the_____ of_____ _____.

Place   day   month   year

Signature of deponent

Name:

UNDERTAKING BY THE PARENT/ GUARDIAN

[To be submitted at the time of admission only]

1. I, Mr./Mrs./Ms._____ (Full Name) Father / Mother / Guardian of _____ (Full Name of student), having been admitted to the University of North Bengal, have received a copy of the UGC Regulations on curbing the menace of Ragging in Higher Educational Institutions, 2009, carefully read and fully understood the provisions contained in the said Regulations.

2. I have, in particular, perused clause 3 of the Regulations and am aware as to what constitutes ragging.

3. I have also, in particular, perused clause 7 and clause 9.1 of the Regulations and am fully aware of the panel and administrative action that is liable to be taken against my ward in case he/she is found guilty of or abetting ragging, actively or passively, or being part of a conspiracy to promote ragging.

4. I hereby solemnly aver and undertake that
   a. My ward will not indulge in any behaviour or act that may be constituted as ragging under clause 3 of the Regulations.
   b. My ward will not participate in or abet or propagate through any act of commission or omission that may be constituted as ragging under clause 3 of Regulations

5. I hereby affirm that, if found guilty of ragging, my ward is liable for punishment according to clause 9.1 of the Regulations, without prejudice to any other criminal action that may be taken against my ward under any penal Law or any Law for the time being in force.

6. I hereby declare that my ward has not been expelled or debarred from admission in any institution in Country on account of being found guilty of, abetting or being part of conspiracy to promote, ragging; and further affirm that, in case the declaration is found to be untrue, the admission of my ward is liable to be cancelled.

Declared this _____day of_____ month of _____ year

Address: Signature of deponent

                                                                 Name:

                                                                 Ph.No./ Mob. No.

VERIFICATION

Verified that the contents of this undertaking are true to the best of my knowledge and no part of the undertaking is false and nothing has been concealed or misstated therein.

Verified at_____ on this the _____of_____, _____.

         Place   day   month   year

                                                        Signature of deponent

                                                        Name: