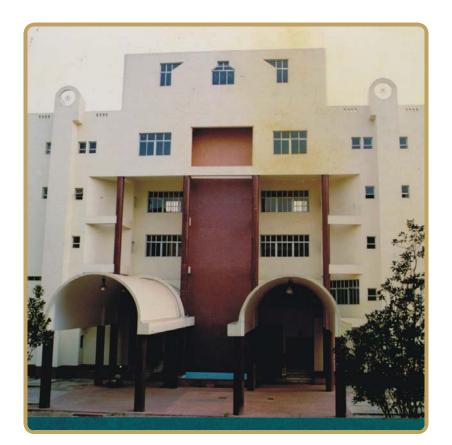# PROSPECTUS

M TECH DEGREE COURSE in Multimedia and Software Systems

(Approved by AICTE & Affiliated to the West Bengal University of Technology, Kolkata)

National Institute of Technical Teachers' Training and Research
Block - FC, Sector - III, Salt Lake City, Kolkata - 700 106, INDIA
2010-2011

CONTENTS

1.0   About NITTTR, Kolkata:

National Institute of Technical Teachers' Training and Research (NITTTR), Kolkata was born in 1965 as Technical Teachers' Training Institute, Calcutta. This was the first of four such institutes (other three being at Chandigarh, Bhopal & Chennai) established by the Dept. of Education, MHRD, Govt of India as *fully centrally funded autonomous institutions*. The primary focus of the Institute is to provide in-service training to the teachers and staff of Degree and Diploma level technical institutions and conducting activities related to the quality improvement of the technical education system of the country. Govt. of India, in 2003, accorded national status to this Institute, in recognition to the expert services rendered for overall improvement of quality of Technical Educational System.

Some of the notable national level projects in which the Institute is presently associated are Consultancy to World Bank assisted Tech. Ed. III project, Formulation of Tech. Ed. QIP Proposal, Facilitating PWD Scheme, Developing Curriculum & Learning materials for National Vocational Education Qualification & Certification Framework, Serving as Nodal agency to Community Polytechnic Scheme etc.

In the year, 2004, the Institute had organized a highly acclaimed International Conference on "*New Challenges in Technology Education for HRD in Asia and the Pacific Region (HRDAP-2004),* which was attended by delegates representing International Organizations, Government, Industry and Academics of National and International repute.

The Institute has highly qualified faculty members and excellent infrastructural support in the form of well-equipped laboratories and other resources. The entire faculty and staff recruitment process, pay scales etc., are as per AICTE/MHRD norms.

The focal activities of the Institute are Short Term Training, Curriculum Development, Learning Resources Development, Research, Educational Management and Extension Services. Besides, the Institute is offering three AICTE approved M.Tech. Degree Programme in Manufacturing Technology,

Multimedia and Software Systems & Mechatronics Engineering affiliated to WBUT.

The Institute has established Extension Centers at Guwahati and Bhubaneswar for reaching out to its clients. The new mandate of the Institute has extended its clientele catchment area outside the country encompassing the Technical & Vocational Institutions of particularly SAARC & ASEAN countries.

2.0   About WBUT:

West Bengal University of Technology (WBUT), Salt Lake City, Kolkata was established by University Act dated 07.08.2000 and started functioning from January 2001. During 2001- 2002, total 42 Engineering & Technology Colleges of West Bengal were affiliated to the University for B.Tech and Management Degrees. For the year (2005-2006) the number till July stands at 78 Colleges.

3.0   About the Department of Computer Science & Engineering

The Department of Computer Science & Engineering was established in the year 1993 with one Professor and two Assistant Professors along with other staff members. Later, another Lecturer has joined the department in 1994. Since the establishment, the department is engaged in various academic activities including conducting International and National Seminars, offering advanced level programmes, infrastructural development, research activities etc. A brief summary of the department and departmental activities for last few years is given below.

A.   Manpower Profile : At present, the department has one Professor, one Assistant Professor, two Lecturers. The present faculty have proven expertise in the area of Distributed Computing, Multimedia, Database, Software Engineering, Geographic Information System, Artificial Intelligence etc. The faculty members have presented a number of research contributions at different International & National Forums.

B.   International/National Linkages : The department is actively involved in organising short term programmes in collaboration with different International & National Agencies. In the recent past, the department has

organised three regional programmes in collaboration with Colombo Plan Staff College, Manila, Philippines. The department has conducted several International Seminars jointly with Jadavpur University and University of Calcutta in the area of Distributed Computing (IWDC). The department has also organised ISTE Summer School for faculty members of engineering colleges and polytechnic system. The department is closely associated with various national bodies including Institution of Engineers(I), Computer Division; Computer Society of India; State Councils of various states; All India Council for Technical Education; Department of Electronics, Ministry of Information Technology, Government of India.

C. Academic Programmes : The department has offered various advanced level programmes in the area of DBMS, Multimedia, Networking, Internet technology etc., for the last ten years on a regular basis. Apart from the routine short-term and long-term programmes, the department has conducted a one year full time Post-Graduate Programme (PGDIM), in collaboration with CMC Ltd., in the area of Information Management during 1994-2000.

D. Research Activities and Publications : All the faculty members of the department are actively engaged in research in different areas of interest. In this process, they have already published about 80 research papers in different National and International Conferences and Journals and have represented the Institute in various International Conferences in USA, Europe and the Asia Pacific region.

E. Liaison with Industries and Universities : The department has a very strong linkage with IT and allied Industries and Universities and experts from there are regularly taking part in the multifarious activities of the department like Curriculum Development, participation in various Seminars and Workshops, taking lectures in various emerging areas etc. The members of faculty of the department are also invited very frequently to work as experts in different academic activities of Universities and other bodies of both National and International levels.

F. World Bank Project : The department was actively involved in World Bank Project on Strengthening Technician Education (Tech Ed - I and Tech Ed - II) Project. Under the Project, the department has developed a number of

IT Curriculum, Instructional Materials and facilitated infrastructural and capacity expansion for the polytechnic system. The department has acted as resource institution in developing MIS and Satellite Based Instructional Material Program for the World Bank States in Eastern and North Eastern Region.

G.   Computational Resources : The department is equipped with the state-of-the-art computing resources including fifty odd clients with several servers in a networked environment. The department also has a leased line for uninterrupted internet connection. The department has designed and developed three modern laboratories (viz., (a) Programming & Database Laboratory (b) Multimedia Engineering Laboratory (c) Linux Laboratory) equipped with adequate hardware and software resources.

Faculty Member & Supporting Staff of the Dept. of Computer Sc. & Engg.

Faculty Members :

Dr. R. Dasgupta
Professor & Head
Area of Interest : DBMS, Software
Engineering, Distributed Computing

Dr. S. Roy
Assistant Professor
Area of Interest : VLSI Design,
Artificial Intelligence, Educational
Informatics

Mr. R. Chatterjee
Sr. Lecturer
Area of Interest : Computer Network,
Object Oriented Programming

Dr. S. Majumder
Professor & Ex-Head
Area of Interest : Multimedia, E-learning, Knowledge Management
(on lien)

Supporting Staff :

1.   Mr. Mainak Mandal
2.   Mr. Utpal Chakraborty
3.   Mr. Indrajit Nandi

4.0   About other Departments:

With a view to providing services for the technical education system of India, the Institute, since its inception in 1965, started its academic operation through creating some departments and centres so that the activities related to various disciplines could be made much more focussed and effective. In the initial stage, there were five well defined departments viz., Civil, Education, Electrical, Mechanical and Science. Later, over the years, several other departments (Computer Science & Engineering, Community Development & Rural Technology, Continuing Education and Educational Planning & Management) were formed as per the needs, from time to time. Two other centres for Curriculum Development and Learning Resource Development were also established to make specific activities in those areas. A brief description of these departments and centres (excluding Computer Science & Engineering) is given below. For further details, please visit our website *www.nitttrkol.ac.in.*

1.   *Civil Engineering Department* :

The Civil Engineering Department is functioning from the inception of the Institute (1965) and since then is actively involved in conducting various academic programmes (Short Term and Long Term) and other academic activities pertaining to the development of technical education system in the Eastern Region. At present, the department has manpower of two Faculty Members and two Staff Members, headed by Prof. M. Das. In the frontier of research activities, publications, liaison with Industries and Universities, the department has taken a very positive and active role for the last four decades. The department has developed four highly equipped laboratories in the areas of Structure, Materials, Geo-Technology etc.

The department of Civil Engineering is actively engaged in various industrial consultancy work and also took lead role in the Building & Works Committee of the Institute.

2. *Community Development & Rural Technology Department* :

The Department of Community Development & Rural Technology was established in early-eighties (1981) with a specific responsibility for monitoring, coordinating and implementing the Community Polytechnic Scheme adopted by the Govt. of India. This department is unique in nature and normally not seen in other academic Institutes or Universities. The major activities of this department include Curriculum Development of Vocational Manpower Development Activities, propagation of Appropriate and Affordable technologies besides providing active support to Community Polytechnic system etc. At present, the department has manpower of two Faculty Members and two Staff Members, headed by Dr. U. C. Kumar.

Started with seven number of Community Polytechnics in early eighties, this department is at present entrusted with ninety-seven Institutions in the States of the Eastern Region and the UT of A & N Islands. The major clientele of this department is concentrated mostly with the people related with rural development, vocational education, NGOs etc.

3. *Education Department* :

The Education Department is functioning from the inception of the Institute (1965) and since then is actively involved in conducting various academic programmes (Short Term and Long Term) and other academic activities pertaining to the development of technical education system in the Eastern Region. At present, the department has manpower of three Faculty Members headed by Prof. Dr. R. Srinivasan. Apart from regular academic activities, the department is involved in various activities related to design and development of tools and instruments in connection with various facets of Education Technology.

4. *Educational Planning and Management:*

Managing of educational institutions, educational programmes plays a vital role for improving quality performances. The Department of Educational Planning and Management was formed in 1991 to address this requirement. At present, the department has a manpower of one faculty member, Prof. Dr. S. Chakraborty. Apart from offering several training programmes on various aspects of

Educational Planning & Management, the department is also engaged in consultancy and research projects related with different areas of technical education.

5.   Electrical Engineering Department :

The Electrical Engineering Department is functioning from the inception of the Institute (1965) and since then is actively involved in conducting various academic programmes (Short Term and Long Term) and other academic activities pertaining to the development of technical education system in the Eastern Region. At present, the department has manpower of four Faculty Members and three Staff Members, headed by Prof. Dr. P. Sarkar. In the frontier of research activities, publications, liaison with Industries and Universities, the department has taken a very positive and active role for the last four decades. The department has developed seven highly equipped laboratories in the areas of Microprocessor and Communication, Measurements, Digital Electronics etc.

The department is also offering M.Tech. Programme in Mechatronics Engineering from the 2005-06 session.

6.   Mechanical Engineering Department :

The Mechanical Engineering Department is also functioning from the inception of the Institute (1965) and since then is actively involved in conducting various academic programmes (Short Term and Long Term) and other academic activities pertaining to the development of technical education system in the Eastern Region. At present, the department has manpower of four Faculty Members and one Staff Member, headed by Prof. Dr. S. Ray. Apart from regular academic activities, the department is involved in various maintenance and related activities since its inception. At present, the department is very vibrant in various academic and research activities including offering M.Tech. Programme in Manufacturing Technology (since 2002-03). The department has developed six highly equipped laboratories in the areas of Robotics, Automation, Heat Engines etc.

The Mechanical Engineering department is also engaged in offering various industry oriented training programmes in last three to four years.

7.   Science Department

The Science Department is functioning from the inception of the Institute (1965) and since then is actively involved in conducting various academic programmes (Short Term and Long Term) and other academic activities pertaining to the development of technical education system in the Eastern Region. At present, the department has manpower of two Faculty Members and two Staff Members, headed by Prof. Dr. A. De. Apart from regular academic activities, the department is involved in research activities in various branches of Science.

The department has developed excellent laboratory facilities in the area of Environment Pollution Monitoring, mostly funded by Ministry of HRD under different project schemes. The department has also state-of-the-art laboratories in the area of Optical Communication.

8.   Curriculum Development Centre :

Formed in seventies, the major activity of this centre relates with the design and development of curriculum as per requirements of different States in the Eastern Region. In this process, the centre designed, developed and revised innumerable number of curricula pertaining to diploma and post diploma programmes for different States following AICTE guidelines. At present, Mr. S. Naskar is the HOD of the Department.

9.   Learning Resource Centre :

Developed in 1970s, the Learning Resource Centre produces and distributes learning resource materials for augmenting teaching-learning process as a whole. Apart from making photography, slide-tape programmes, charts, models, videos and digital photography, the centre has designed and developed a mini studio where regular activities are being done for making educational video films on different areas of technology and management which, in turn, are being telecast by Govt. of India through its Gyan Darshan channel. The centre has a manpower of four technically trained persons and two supporting staff. The centre is headed by Prof. Dr. S. Chakraborty as an additional responsibility.

5.0   Organisational Structure & Central Resources:

5.1   *Organisational Structure:*

The affairs of the Institute are managed by the Board of Governors (formed by Ministry of HRD). The Director is the Member Secretary of the Board and the overall Academic and Administrative head of the Institute. All the departments, centres and sections are working under the direct control of the Director. While the BOG is assisted by the Finance Committee in financial matter, for various supporting activities, the Board of Governors has formed different Committees/Councils etc. One such council, namely the Academic Council, takes care of all the academic issues and works as the highest body in academic matters.

5.1   *Library Facility:*

NITTTR, Kolkata has a Central Library with more than 19,500 books in different areas of Engineering, Technology, Science and Humanities. Approximately, 2000 titles are on Computer Science and allied areas related to the course. The library has got good reading facility. Students will also be eligible to borrow books from the library.

5.2   *Hostel Facilities:*

Willing students will be provided accommodation in the hostel situated within campus, subject to availability and on payment of usual charges. At present, the charges are @ Rs.15/- per day on twin sharing basis. Meal charges extra.

5.3   *Administrative and Accounts Sections:*

Like all other Central Govt. autonomous institute, NITTTR, Kolkata has full-fledged Administrative and Accounts Sections where around fifty staff members are looking care for all the administrative and accounting activities of the Institutes following the Govt. of India/BOG norms. Mr. A. Chakraborty and Mr. S. Goswami are in charges of these two sections respectively.

5.4 Entertainment and Others:

The Institute has a sprawling campus of eleven acres at Labony, Salt Lake, Kolkata consisting of two academic-cum-administrative buildings, students and executive hostels, staff quarters, auditorium of 400+ capacity, play grounds, facilities for indoor and outdoor games, dispensary etc. Besides, a separate block of residential quarters, around 3 k.m. away from the Labony Campus was developed with financial assistance from World Bank to accommodate members of faculty and staffs.

6.0 About the M.Tech Programme in Multimedia and Software Systems:

6.1 Rationale:

The present economic and foreign policy adopted by the Govt. of India has created a great opportunity in software industry and, in turn, produced a very high demand of qualified software professionals to cater to the needs of National and International markets. As a consequence of this, both industries and academia are facing the shortage of qualified software professionals. Present situation has encouraged NITTTRs to offer best possible courses in the area of Multimedia & Software Systems so as to produce industry professionals and teachers who, in turn, will contribute maximum under the changed environment.

The emergence of computers with high speed processors, fast internal buses, high resolution graphic display, large optical memories have provided the ability to capture, store and process high quality audio and video and embed them at different suitable places to make the final software product more and more attractive and effective. As a result, design and development of software has now become more a team effort rather than individual expertise and intelligence. Moreover, cohesiveness amongst the team members for maintaining the time target, cost optimization, standardization, documentation, testing, quality control etc., has become imperative components to meet the

national and international challenges. New generation of manpower with appropriate knowledge and skill sets are thus required to be developed for this purpose.

The Department of Computer Science & Engineering, NITTTR, Kolkata has felt this need of developing specialized manpower and started to offer a Post Graduate Programme (M. Tech) in the area of *Multimedia & Software Systems* since 2005, where state-of-the-art technology in the areas of Multimedia and Software Engineering are being covered in depth to cater to the present and near future requirements of the Industry. Moreover, passouts of this programme will be considered as the next-generation University/Engineering College teachers and researchers who, in turn, will work as the change agents for decades to come. This postgraduate programme in Multimedia and Software Systems attempts to integrate various aspects of multimedia technologies as well as software development processes so that the passouts can deliver the present requirements of Industry and Academia and can bring about a new height of excellence in future.

6.2 Course Duration:

The M.Tech course is a 2-year 4 semester full-time course. The first two semesters will cover theory and practical classes, while last two semesters will be for dissertation work.

6.3 Course Calendar:

The course calendar for the academic session 2010-11 is given below.

PROVISIONAL COURSE CALENDAR*
(Academic Session 2010-2011)

Last date of receiving applications	:	June 11, 2010
Date of Interview	:	July 12 - 16, 2010
Provisional Admission+	:	July 21 - 23, 2010

Fees
a) Admission Fee	:	Rs. 1000/- (one time)
b) Security Deposit	:	Rs. 2500/- (one time & refundable after completion of the course)
c) Tution Fees	:	Rs. 6000/- (per semester)
d) Others	:	As applicable by WBUT from time to time

Total fees to be paid at the time of admission Rs. 9500/-
Semester fees (Rs. 6000/- each) for the 2nd – 4th Semester to be paid at the beginning of each semester.

Class commences	:	August 03, 2010

* The dates and fees are provisional; the final dates and fees will be announced in accordance with WBUT programme calendar and fee structures.

+ For those candidates, whose final semester mark sheets are not published till the date of admission, will be admitted provisionally subject to qualifying in the final semester. However, in case, the candidate fails to submit the final mark sheet/certificate within a stipulated time frame decided by the Institute, the admission will stand cancelled and no refund of money will be given to the candidate.

6.4 Course Objective:

After successful completion of this M.Tech. Programme in Multimedia and Software Systems, students will be able to :

- Design complex software systems

- Develop complex software using DBMS

- Develop software using Object Oriented Technology

- Acquire, use and share knowledge using KMS

- Design and develop multimedia software including learning management system

- Assure quality, reliability in the design and development process of software

- Manage a complex software project

6.5 Course Structure:

(Course Structure may be modified soon, in case it is modified, the same will be notified in due time)
FIRST SEMESTER

A.   THEORY

SL. NO.	CODE	THEORY	CONTACTS (PERIODS/WEEK)				CREDITS
			L	T	P	TOTAL	
1.	MMS101	Data Structure and Algorithms	3			3	3
2.	MMS102	Computer Architecture and Operating System	3	1		4	4
3.	MMS103	Multimedia Engineering and Applications	3	1		4	4
4.	MMS104	Computer Network and Web Technology	3	1		4	4
5.	MMS105	Principles of Software Engineering	3	1		4	4
6.	MMS106	Advanced Engineering Mathematics (MTI105 of Manufacturing Tech)	3			3	3
		Total of Theory				22	22

B.   PRACTICAL

SL. NO.	CODE	PRACTICAL	CONTACTS (PERIODS/WEEK)				CREDITS
			L	T	P	TOTAL	
7.	MMS191	Programming Lab			3	3	2
8.	MMS192	Software Engineering Lab			3	3	2
9.	MMS193	Web Technology Lab			3	3	2
		Total of Practicals				9	6
		Total of Semester				31	28

SECOND SEMESTER

A. THEORY

SL. NO.	CODE	THEORY	CONTACTS (PERIODS/WEEK)				CREDITS
			L	T	P	TOTAL	
1.	MMS201	Object Oriented Software Design	3			3	3
2.	MMS202	Software Project and Quality Management	3	1		4	4
3.	MMS203	Database Management Systems	3			3	3
4.	MMS204	Multimedia Design & E-learning Systems	2	1		3	3
5.		Elective I	3	1		4	4
6.		Elective II	3			3	3
Total of Theory						20	20

B. PRACTICAL

SL. NO.	CODE	PRACTICALS	CONTACTS (PERIODS/WEEK)				CREDITS
			L	T	P	TOTAL	
7.	MMS291	Object Technology Lab			3	3	2
8.	MMS292	Multimedia Lab			3	3	2
9.	MMS293	Database Lab			3	3	2
Total of Practicals						9	6
Total of Semester						29	26

ELECTIVES : Two subjects to be chosen from the following two elective groups

Elective I

Code	Subject
MMS205	Distributed Software System
MMS206	Design and Analysis of Algorithms
MMS207	Software Reuse and Requirement Engineering
MMS208	Operations Research (MTI112 of Manufacturing Tech)

Elective II

Code	Subject
MMS209	Topics on Databases
MMS210	Knowledge Engineering
MMS211	Robotics (MTI109 of Manufacturing Tech)
MMS212	Real Time and Embedded Systems

THIRD SEMESTER

A.   SESSIONAL

SL. NO.	CODE		CONTACTS (PERIODS/WEEK)				CREDITS
			L	T	P	TOTAL	
1.	MMS301	Seminar				3	2
2.	MMS302	Pre-submission Defence of Dissertation					4
3.	MMS303	Dissertation (Progress)				24	18
Total of Semester						27	24

FOURTH SEMESTER

B.   SESSIONAL

SL. NO.	CODE		CONTACTS (PERIODS/WEEK)				CREDITS
			L	T	P	TOTAL	
1.	MMS401	Dissertation				24	18
2.	MMS402	Post-submission Defence of Dissertation					6
Total of Semester						24	24

6.6   Course Fees:

a) Admission Fee	:	Rs. 1000/- (one time)
b) Security Deposit	:	Rs. 2500/- (one time & refundable after completion of the course)
c) Tution Fees	:	Rs. 6000/- (per semester)
d) Others	:	As applicable by WBUT from time to time

Total fees to be paid at the time of admission Rs. 9500/-
Semester fees (Rs. 6000/- each) for the 2nd – 4th Semester to be paid at the beginning of each semester.

Apart from above course fees, the students have to pay Registration Fees, Examination Fees and other charges, as scheduled by WBUT, from time to time.

6.7   Degree:

WBUT will award degree for the successful candidates.

6.8   Eligibility, No. of Seats & Admissions Criteria:

B.E./B.Tech. or equivalent from recognized University in the area of Computer Science & Engineering, IT, Electronics, Electrical or equivalent.

Presently there will be total 28 seats, out of which 10 seats will be under General Category, 5 seats for Sponsored Candidates from Polytechnic/Engineering College/ Industry and 6 seats will be reserved for SC/ ST, 7 seats for OBC.

Under General and SC/ST/OBC Category, preference will be given to GATE qualified candidates with 55% marks in their engineering examination. Sponsored candidates must have a minimum of one year full-time work experience and 55% marks in their engineering examination.

6.9 Selection Process:

All eligible applicants (GATE qualified or non-GATE) will have to appear at the written test/interview to be conducted for the purpose.

Fulfillment of minimum eligibility criteria does not guarantee for call for interview

6.10 Attendance & Evaluation Method:

Attendance, Examinations and Evaluations will be as per WBUT Examination Rules.

6.11 Application Procedure:

The aspiring students need to apply in accordance with the application format enclosed. The application form duly filled in is to be submitted to the following address within 11.06.2010 along with the documents mentioned in Application Form.

Head
Department of Computer Science & Engineering
National Institute of Technical Teachers' Training and Research, Kolkata
Block –FC, Sector – III, Salt Lake City,
Kolkata- 700 106, INDIA
Phone: 2337–3959 (Direct), 2337–0479/4125
(Extn.502/504)
Fax:91–2337–6331 (Direct) /6290 (Code IF-40)

APPLICATION FORM
NATIONAL INSTITUTE OF TECHNICAL TEACHERS' TRAINING AND RESEARCH, KOLKATA
Block-FC, Sector-III, Salt Lake City
Kolkata-700 106, INDIA

M TECH DEGREE COURSE IN MULTIMEDIA AND SOFTWARE SYSTEMS (2010-2011)

Affix Photograph with signature

NAME: _____

LOCAL ADDRESS: _____

_____

_____ PIN: _____

E-MAIL: _____ TELEPHONE NO : _____

PERMANENT ADDRESS: _____

_____

_____ PIN: _____

DATE OF BIRTH: _____   SEX: M/F
(dd/mm/yy)

SC/ST/OBC: Y/N   HOSTEL FACILITY NEEDED: Y/N

FATHER'S/MOTHER'S NAME: _____

DEGREE (Mention from school leaving level and above):

INSTITUTION/ UNIVERSITY NAME	YEAR OF PASSING	EXAM/ DEGREE & SUBJECTS	% MARKS/ GRADE POINT	DIVISION/ CLASS

GATE SCORE AND VALIDITY *(if applicable)*: _____

DETAILS OF JOB EXPERIENCE *(if any)*: _____

_____

NAME OF SPONSORING ORGANISATION *(for sponsored candidates)*:

_____

DATE: _____   _____

                                                  APPLICANT'S SIGNATURE

DOCUMENTS TO BE ATTACHED:
- *Photo copies of all mark sheets, GATE score (where applicable), certificates and proof of age*
- *In case of SC/ST/OBC, proof of the same*
- *Letter of sponsorship for sponsored candidates*
- *A Demand Draft of Rs. 250/- (non refundable) drawn in favor of Director, NITTTR, Kolkata, payable at Kolkata*

APPLICATION FORM TO BE SUBMITTED IN SEALED ENVELOP SUPERSCRIBING "*APPLICATION FOR M.TECH.(MSS)*" TO:

Head, Department of Computer Science & Engineering
National Institute of Technical Teachers' Training and Research, Kolkata
Block –FC, Sector-III, Salt Lake City, Kolkata-700 106, INDIA
                                (To reach latest by June 11, 2010)