APPLICATION

towards grant of

DEEMED-TO-BE-UNIVERSITY STATUS

(Under Section 3 of UGC Act, 1956)



Submitted by

National Institute of Technical Teachers Training and Research Taramani, Chennai – 600113 (Ministry of Education, Govt. of India)

Website: www.nitttrc.ac.in., Email: dir@nitttrc.ac.in



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EXECUTIVE SUMMARY

our National Institutes of Technical Teachers Training and Research (NITTTRs) were established during the year 1964 to 1967 as autonomous institutes by the Ministry of Education, Government of India to improve the quality of the technical education system in the Country. With this mandate, NITTTR Chennai takes initiatives to offer need-based human resource development programmes in the Southern States in particular through training, and development of curricula and instructional resources. The growth and development of technical education system depend on the quality of teachers, and therefore, NITTTR Chennai is committed to offering short- and long-term in-service training programmes. During the year 1976-2000, the Government of India has appointed a number of Committees to review and suggest directions to TTTI/NITTTR for their future functioning. They were Kelkar Committee (1976), Jha Committee (1978), Bhattacharya Committee (1991), and Indiresan Committee (2000). Prof. Bhattacharya Committee (1991) recommended the institute be deemed to be universities, so as to expand its scope of functioning.

To be the institute of repute, NITTTR Chennai concentrate on maximizing our extraordinary strengths: depth and breadth in the areas of our expertise, a deeply held commitment to challenges, and a genuine desire to excel in Technical Education in the world. In the past 50 years, we served the country in the implementation of World Bank/ADB-funded Technical Education Projects, and others project of national importance viz., NMEICT, SWAYAM, NITTT, ARPIT, etc., Over the years, the NITTTR Chennai has gained widespread recognition as one of the institutions, which will empower learners and provide enough opportunity to upskill them. NITTTR Chennai has a special status with the Indian Technical Economic Cooperation (ITEC) Countries, supported by the Ministry of External Affairs, Govt. of India, due to its vast trained alumni spreading over 106 countries. It had only one ITEC course in the year 1982 and now it has expanded its wing to 16 courses in the year 2019 in the emerging and thrust areas of global importance. Due to our strong international base, it is felt along with the model of United Nation Institute of Training and Research (UNITAR), Geneva, Switzerland in serving the global

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community, NITTTR Chennai should be rechristened as the deemed to be university in creating a sustainable educational ecosystem at the National and Global arena.

The country's teaching-learning environment has changed suddenly in the year 2020 due to the sudden outbreak of the Pandemic. There have been global changes as well, such as the redefinition of the creation of a knowledge society, and explosive growth in the use of online tools for teaching. In the field of education, MOOCs and Online Education were considered to be the disruptive technology. All these changes have led to a redefinition of the role of technology in teaching and learning. Under the said circumstances of change, NITTTR Chennai expanded its wing in embracing online training. Through the National Mission on Education through Information and Communication Technology (NMEICT) during 2011-2014, NITTTR Chennai offered ten web-based faculty development programmes. Pandemic did not stop our academic activities and we conducted online training programmes and empowered more than 1,20,000 teachers both in synchronous and asynchronous modes. The true essential character of NITTTR Chennai, as an institute, has refined its understanding and mode of training to achieve our vision. We also proved to be the global institute, by offering special e-ITEC programmes of the Ministry of External Affairs, Govt. of India in the area of Technology-Enabled Learning to the international community during the year 2020.

NITTTR Chennai proposed the framework to accredit and transfer the accrued credits (Bank of Credits) for the successful completion and certification of training programmes. In this process, the award of the professional degree will be possible for the working professionals once NITTTR Chennai declared as deemed to be university status. In addition to the routine continuing education programme, NITTTR Chennai also offers Masters and Doctoral research in the area of Civil and Environmental Engineering; Engineering Education; and Electrical, Electronics, and Communication Engineering. In the past three decades, we offered doctoral research in the area of Engineering Education, affiliated with the University of Madras. Owing to technological advancement, we are embracing the techniques and tools to empower technical teachers. The special courses are slated in the area of immersive technologies (Virtual Reality and Augmented Reality) and Gamification in education. By training the teachers in the emerging thrust areas, we are placing them at ease in developing the

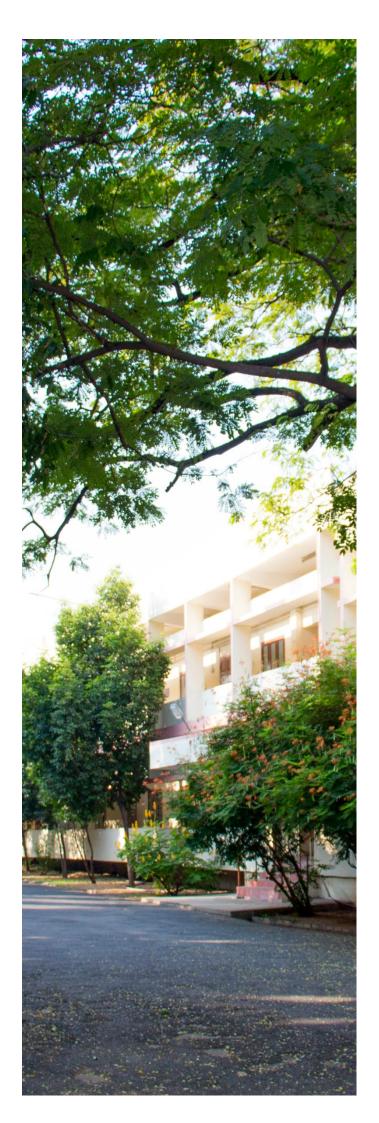
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knowledge society. The broad goals of NITTTR Chennai are to excel in technology-enabled engineering education and consequently focuses on the core engineering themes. The status of deemed to be university, enunciates NITTTR Chennai being recognized as a global leader in engineering education research. It offers more flexibility and choice based system to the students in the academic programmes, by inviting and stimulating ambiance for education and research, and a rich suite of extra- and co-curricular activities.

NITTTR Chennai wishes to offer courses of international standards, viz., Master's in Learning, Design, and Technology; Education for Sustainable Development; Cognitive Computing; Society 5.0 and Smart Infrastructure Engineering and Management. In addition to the Master's programme, a specially structured MBA programme in the area of International Education Policy and Educational Transformation is proposed to offer. All the programmes will provide personality development, life-skills, and career planning, which will be a part of the holistic development of the student community. In particular, the status of deemed to be university will nurture the large groups of faculty members working on transformational technologies in engineering education aligned to the doctrines of National Education Policy 2020, which have the potential to address the societal challenges faced in India today. It outlines steps to increase the quality and quantity of research output through an increase in research intensity, quality faculty strength, Ph.D. student enrolment, research infrastructure, and engagement with the clientele system.





Signed Application Form



PART-1 (Registration)

1. Details of applicant Sponsoring body (Trust / Society/Company):

Basic Details :			
Name: National Institute of Technical Teachers Training and Research	Address : Taramani, Chennai 600 113	State : Tamil Nadu	City : Chennai
Contact Details of the Authorities of the Ins	titution :		
Name of Vice Chancellor/Director : Dr. Sudhindra Nath Panda	Email: dir@nitttrc.ac.in	Mobile: 9434009156	Contact No. : 04422545406
Name of Nodal Officer of Institute : Dr. E S M Suresh	Email: esmsuresh@nitttrc.ac.in	Mobile: 9444284464	Contact No.: 04422545423
Details of applicant Sponsoring body (Trust	/ Society/Company):		
Name of the Sponsoring body : Ministry of Education	Address of the Sponsoring body: Secretary, Higher Education Department, Shastri Bhavan, New Delhi	State : Delhi	City: 10
Details of Secretary of Sponsoring body:			· · · · · · · · · · · · · · · · · · ·
Name : Mr. Amit Khare	Designation : Secretary, Higher Education Department, Shastri Bhavan, New Delhi	Email: secy.dhe@nic.in	Mobile : 9899534994
Contact No : 011-23386451	Fax: 011-23385807	Address : 127-C, Shastri Bhawan, New Delhi	Upload supporing document for Sponsoring Body: <u>View Document</u>

2. Details of the Deemed to be University:

Name of the Deemed to be University: National Institute of Technical Teachers raining and Research		Address & location of the Deemed to be University: Tarar Chennai 600 113	
lame and details of the Institution/Institution	ns which will form the Deemed	to be University :	
NAME OF INSTITUTE	HEAD EMAIL		TYPE
National Institute of Technical Teachers Training and Research	dir@nitttrc.ac.in		

PART-2 (Submission of application)

1. A Detailed Project Report (DPR) containing its fifteen year detailed Strategic Vision Plan and a five year rolling implementation plan viz. Academic Plan, Faculty Recruitment Plan, Students Admission Plan, Research Plan, Networking Plan, Infrastructure development Plan, Finance Plan, Administrative Plan, Governance Plan, etc, with clear annual milestones and action plans on how the new Institution Deemed to be University is to be set up, with identifiable outputs and outcomes:

Yes uploaded <u>View Document</u>

Whether the information uploaded on the DTBU Web Portal has also been publicly disclosed on the website of the Institution duly certified by the Head: You (www.nitttre.ac.in)

2. Details of academic & physical infrastructure:

Title of the land: President of India (NITTTR)	Areas of total land available In acres: 24.871
Areas of total land available In Sq. Meters: 100650.4	Land Type: Free hold
In case of Lease hold,Period of Lease hold (month): 0	Administrative building (Total Built-up area (in Sq. Meters)) : 433
Academic building (Total Built-up area (in Sq. Meters)) : 12240.66	Departmental Library and Central Library (Total Built-up area (in Sq. Meters)): 1187.27

Others facilities (Total Built-up area (in Sq. Meters)): 433	No. of Lecture halls: 26
No. of Hostels (Boys & Girls separately) with students accommodation : 2	No. of teacher residence with faculty accommodation : 21

Other common and recreational facilities : $\underline{\text{$^{\perp}$ View Document}}$

Seating Capacity	Land Area(in Sq. Meters)	Location
150	493.82	Smt. Indira Gandhi Auditorium
250	206.26	Thiruvalluvar Auditorium (Dr. A.P.J. Abdul Kalam A

3. Corpus fund:

Details of Corpus Fund (Undertaking to the effect that the Corpus Fund to be created shall be irrevocable in nature and the interest accrued on it shall be used only for the purpose of development of the Institution Deemed to be University):

- 4. No Objection Certificate (NoC) / Views of the State Government: \(\frac{1}{2}\), View Document
- 5. Details of the not-for-profit Society/Trust/Company established for Deemed to be University:

i.	Whether the applicant sponsoring body has been established exclusively for running educational institutions?(Upload the Registration certificate as well as Registered Deed which specifies that the sponsoring body is exclusively for running educational activities and no other activities are being carried out or shall be carried out in future under it).	<u>& View</u> <u>Document</u>
ii.	(a) Whether a separate not-for-profit Society/Trust/Company in the name of Deemed to be University has been created?	<u>& View</u> Document
iii.	III. Whether all the moveable and immoveable assets are legally registered in the name of the Deemed to be University?	<u>ა View</u> Document
iv.	IV. Legal undertaking to the effect that all moveable and immoveable assets of the institutions shall be used only for the purpose of conducting academic activities, promotion of research and related administrative requirements of the Institution Deemed to be University?	<u>ა View</u> Document

6. Department-wise teacher student ratio:-

Department	Year of Starting	Program	Student in Department	Teacher in Department	Teacher Student ratio
Department of Civil and Environmental Engineering	1964	1	30	3	10.00
Department of Computer Science and Engineering	1985	0	O	1	0.00
Centre for Educational Management & Applied Psychology	2001	0	0	1	0.00
Centre for Educational Media and Technology	1985	1	0	2	0.00
Department of Engineering Education	1964	0	0	2	0.00
Department of Electrical & Electronics and Communication Engg.,	1964	1	2	3	0.00

Department of Mechanical Engg.,	1964	0	0	2	0.00
NITTTR Extension Centre, Bengaluru	1979	0	0	1	0.00
NITTTR Extension Centre, Vijayawada	2017	0	0	1	0.00
Centre for Rural and Entrepreneurship Development	1979	0	0	1	0.00
Centre for Curriculum Development, Planning and Coordination	1964	0	0	1	0.00
Centre for International Affairs	2010	0	0	1	0.00
Centre for Academic Studies	2020	0	0	2	0.00
NITTTR Extension Centre, Kalamassery	1965	0	0	1	0.00
NITTTR Extension Centre, Hyderabad	1985	0	0	1	0.00

7. Department-wise list of faculty:-

Department	Name	Designatiom	Qualification	No of Research publication	Pay Scale
Director for Office	Dr.Sudhindra Nath Panda	Professor	Ph.D	[SCOPUS:-67] [WOS:-60] [PEER:-154]	Rs. 2,24,100/-
Extension Centre, Vijayawada	Dr.C.R.Nagendra Rao	Professor	M.Tech., Ph.D., B.Tech.Ed.,PGDTCA	[SCOPUS:-2] [WOS:-0] [PEER:-0]	Pay level 14
Department of Civil PRO Environmental Engineering	Dr.E.S.M.Suresh	Professor	B.E., M.E., Ph.D	ISCOPUS:-111 IWO311 [PELK:-37]	PavLevel 14
Department of Engineering Education	Dr.S.Renukadevi	Professor	MÇA, M.Phil,, Ph.D., PGDGC	[SCOPUS:-1] [WOS:-0] [PEER:-20]	PavLevel14
Department of Electrical, Electronics and Communication Engineering	Dr.G.Kulanthaivel	Professor	B.E., M.E., PGDCA., MBA., Ph.D.	[SCOPUS:-26] [WOS:-0] [PEER:-0]	PayLevel14
Centre for Rural and Entrepreneurship Development	Dr.R.Santhakumar	Professor	B.E., M.E., Ph.D	[SCOPUS:-0] [WOS:-0] [PEER:-7]	Pay Level14
Centre for Educational Management & Applied Psychology	Dr.R.Rajendran	Professor	M.A., M.Ed., M.B.A., Ph.D.	[SCOPUS:-8] [WOS:-8] [PEER:-5]	PayLevel14

		Deemed to	be University		
Centre for Educational Media and Technology	Dr.P.Malliga	Associate Professor	B.E., M.S., M.S., Ph.D	[SCOPUS:-1] [WOS:-1] [PEER:-22]	PayLevel13A
Extension Centre Hyderabad	Dr.Umasankar Sahu	Associate Professor	B.E., M.Tech., Ph.D	[SCOPUS:-1] [WOS:-2] [PEER:-2]	PayLevel 13A
Extension Centre Bengaluru	Er.V.Sivakumar	Associate Professor	B.E., M.E	[SCOPUS:-0] [WOS:-0] [PEER:-0]	PayLevel 13A
Department of Electrical, Electronics and Communication Engineering	Dr.G.A.Rathy	Associate Professor	B.E., M.E., Ph.D	[SCOPUS:-2] [WOS:-1] [PEER:-20]	1,39,400/- Level 13 A1 cell 9
Department of Civil and Environmental Engineering	Dr.G.Janardhanan	Associate Professor	Ph.D	[SCOPUS:-11] [WOS:-7] [PEER:-33]	pay level 13A
Department of Engineering Education	Dr.K.S.Giridharan	Associate Professor	B.E., M.Tech., Ph.D	[SCOPUS:-2] [WOS:-1] [PEER:-9]	PayLevel 13A1
Department of Mechanical Engineering	Dr.S.Somasundaram	Associate Professor	B.E., M.E., Ph.D	[SCOPUS:-2] [WOS:-1] [PEER:-7]	PayLevel 13A1
Department of Mechanical Engineering	Er.M.Senthilkumar	Associate Professor	B.E., M.Tech	[SCOPUS:-5] [WOS:-2] [PEER:-8]	PayLevel 13A1
Department of Computer Science and Engineering	Dr.V.Shanmuganeethi	Associate Professor	B.E., M.E., Ph.D	[SCOPUS:-10] [WOS:-4] [PEER:-14]	PayLevel 13A1
Department of Civil and Environmental Engineering	Dr.K.S.A.Dinesh Kumar	Associate Professor	B.E., M.E., Ph.D	[SCOPUS:-2] [WOS:-1] [PEER:-5]	PayLevel13A1
Department of Electrical, Electronics and Communication Engineering	Dr.P.Sivasankar	Associate Professor	B.E., M.E., Ph.D	[SCOPUS:-13] [WOS:-1] [PEER:-18]	1,39,400/- Level 13 A1 cell 3
Centre for Educational Media and Technology	Shri.A.P. Felix Arokiyaraj	Assistant Professor	M.Sc.	[SCOPUS:-0] [WOS:-0] [PEER:-0]	79,800- 1,31,700

8. Justification as to how the Courses are devoted to study and research in unique and emerging areas of knowledge not being pursued by existing institutions.:

Yes uploaded. <u>Usew Document</u>

9. Whether syllabi of the Courses and Research Programmes to be conducted in the emerging areas of knowledge have been prepared?:

Yes uploaded. <u>& View Document</u>

10. Other Details:

ii.	Undertaking to the effect that the Institution(s) shall revise its MoA/Rules as per the existing UGC Regulations before issuance of Notification by this Ministry.	<u> </u>
iii.	Undertaking to the effect that the Institution(s) is a not-for-profit organization and shall not be engaged in commercialization of higher education.	丛 View Document

Undertaking to the effect that after declaration of the Institution as Deemed to be University, it shall not use the word 'University' suffixed to its name but may mention the words "deemed to be university" within parenthesis suffixed thereto.

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Declaration: I hereby declare that the details furnished above are true and correct to the best of my knowledge and belief and Copies of the documents uploaded on the Commission's web portal shall also be publicly disclosed on the website of the institution, duly certified by the Head of the institution. Any information found to be false after due verification shall be liable for criminal prosecution under the Indian Penal Code, 1860, as amended from time to time.

PROF. DR. SUDHINDRA NATH PANDA

Sign:

Official Seal:

निदेशक / DIRECTOR

राष्ट्रीय तकनीकी शिक्षक प्रशिक्षण एवं अनुसंधान संस्थान National Institute of Technical Teachers Training & Research

भारत सरकार, शिक्षा मंत्रालय Government of India, Ministry of Education तरमणि, चेन्नै-६००११३./Taramani, Chennai-600 113.



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1) INTRODUCTION

The National Institute of Technical Teachers Training and Research (NITTTR) Chennai was established as an autonomous institute by the Ministry of Education (MoE), Government of India in the year 1964 to improve the quality of technical education system in India and in the southern region in particular. With this mandate, the institute takes initiatives to offer need based human resource development programmes through appropriate modes and develop curricula and instructional resources. It also fosters research in core engineering areas and also in the inter-disciplinary areas of engineering education and offers consultancy services for the total development of engineering colleges, polytechnics, industry, service sector, and the community at large. In carrying out the above mandate, the institute collaborates with national and international institutes, universities and other agencies interested in and / or deriving benefits from the technical education and training. Over the years, NITTTR Chennai transformed its programme and started offering Doctoral and Master's programmes in the area of Engineering & Technology and Engineering Education.

In the past five decades, NITTTR Chennai offered training programme in direct contact mode, for the past few years institute expanded its wings to provide training through online mode and the Ministry of Education, GoI has designated NITTTR Chennai as one among the nine National

Coordinators of SWAYAM for the Teacher Training. During the year 2020, Ministry of Education and AICTE, ventured into reforming the technical education by empowering the teachers through the National Initiative for

NITTTR CHENNAI DESIGNATED AS THE

NATIONAL COORDINATOR FOR SWAYAM

(TEACHER TRAINING) AND COORDINATOR
NATIONAL INITIATIVES FOR TECHNICAL

TEACHERS TRAINING (NITTT)

Technical Teacher Training (NITTT), which covers the entire gamut of newly inducted and senior faculty members for which NITTTR Chennai has been identified as the Coordinator (NITTT). Under Pandit Madan Mohan Malviya National Mission on Teacher and Teaching

(PMMMNMTT), Department of Civil and Environmental Engineering of NITTTR Chennai has been designated as the National Resource Centre to offer courses in ARPIT (Annual Refresher Programme in Teaching). Over the years, NITTTR Chennai transformed its mode of training in meeting the demand of clientele system.

The vision of NITTTR Chennai is to lay down future realistic goals of the Institute in catalyzing

the regeneration of the training in meeting the demand of the clientele system. Tapping the potential of ICT and encompassing the need of present generation technical teachers, there is a strong need in imparting training in the cutting-edge technologies & research outputs, which in turn get translated to the student community. Thus, it establishes a unique identity for the development of high-quality human & knowledge society.



From face-to-face contact mode training, to online synchronous and asynchronous training programme.

During Pandemic period, through online SWAYAM and training courses more than 1,50,000 learners empowered.



Currently, the Institute has also greatly diversified from in-person training to e-Learning and development of MOOCs, accounting for more than 1,50,000 participants attending from all corners of the world through online/virtual learning environment. In carrying out its mission, the Institute naturally places much emphasis on delivering learning-related products and services, on transferring knowledge, imparting skills and raising awareness with an aim to bring about changes in behavior, and to develop other capacities of its beneficiaries.

Parallel to training, the Institute also engages in offering master studies and doctoral research in emerging areas. It also offers advisory support services to state governments and other

educational institutions at achieving broader social and economic development outcomes, such as developing institutional capacities.

By 2030, NITTTR Chennai will be recognized locally, regionally, nationally, and internationally as a provider of highest quality training to the fraternity of technical teachers through structured and enriched programmes. NITTTR Chennai will be known as 'a great place to get educate, enrich and enhance the skills'. Our stakeholders will be delighted with the innovative industry-oriented curriculum development, focus on technical, professional, and higher skills with the inspirational facilities. The services to the clientele system will be flexible, responsive, and effective, and the institute will enjoy very high levels of trainer's response. NITTTR Chennai will continue to be at the heart of regeneration strategies in the southern region of the country and work closely with the Directorate of Technical Education of the southern states.

a. Genesis and transformation of TTTI to NITTTR

The inception of the NITTTR [formerly TTTI (SR)] Chennai in the state of Tamil Nadu was the result based on the recommendation of the All-India Council for Technical Education (AICTE), Government of India, to provide professional training of technical teachers in Engineering and Engineering Education subjects. The Institute formally came into existence on 14th December 1964, and started its operation at the Central Polytechnic (CPT) campus, Chennai, though, the Institute started functioning in CPT in 14th December 1964, the foundation stone of its permanent campus was laid at Taramani, in the science city area, after the allotment of the 26 acres of land by the Govt. of Tamil Nadu. Thus, the Institute decided to celebrate 14th December as its Institution Day. In addition to the headquarters, the institute also established its extension centers at each of the southern states as per the recommendation of Kelkar Committee (1976). It was realized that, the growth of our country depends upon the

establishment of a technical knowledge society and to do so we need to have competent technical teachers who are trained in original and applied research experience. NITTTR Chennai practically focused in empowering technical teachers through various teaching-learning techniques.



Figure 1: Extension centres in various southern state

b. Expert Committees Recommendation

The institute has been functioning over the last fifty-six years and during this period, the Government of India have appointed a number of committees to review and suggest directions to TTTI / NITTTR for their future functioning. They were Kelkar Committee (1976), Jha Committee (1978), Bhattacharya Committee (1991), and Indiresan Committee (2000). There was also a special committee appointed under the chairmanship of Shri. Vikram Prakash on the staff structure of TTTI's in 1977. The Bhattacharya Committee (1991) outlined the need for designating TTTI as Deemed Universities. It is also suggested to orient the training programme to industry personnel and also to offer master's programme and training programme in Modular mode. The various committee commented to offer the courses in the thrust areas and it is evident that due to mushrooming of engineering colleges, it is entrusted with greater responsibility to improve the quality of technical education.

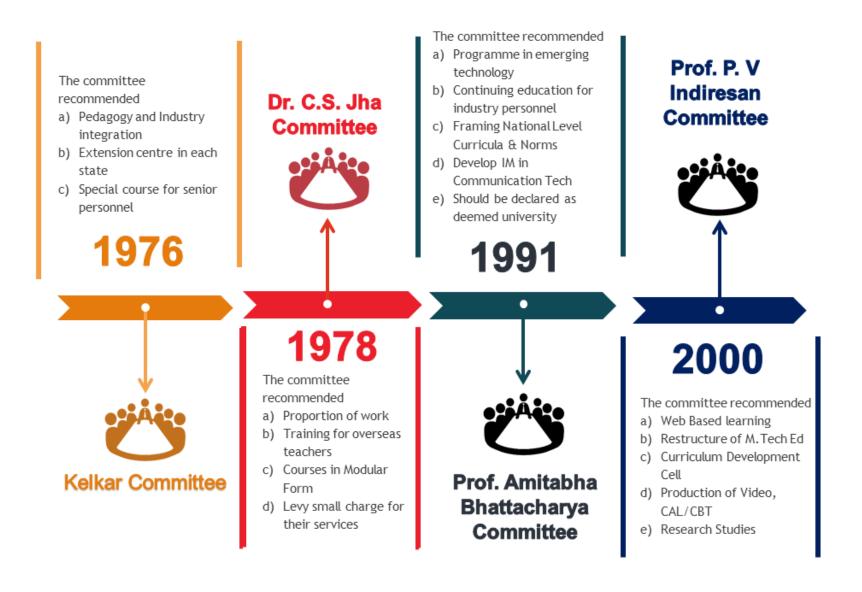


Figure 2: Expert Committee and its recommendation

The initiation of a programme to improve the quality of teaching and administration with sound research findings is pushed forward with the utmost speed and determination. NITTTR Chennai transformed its system and mode of training based on the need of the technical education and served to the polytechnic and engineering colleges faculty members. Now to empower them with high degree of quality, in aligned with the National Education policy 2020, to increase the gross enrolment ratio wish to offer Master's and Doctoral research programmes in the emerging areas. To attract quality faculty members from diverse backgrounds and to offer them an excellent educational experience, it offers more flexible and choice-based credit system in the academic programmes. The institute will create an ambience for education and research, with a rich suite of extra- and co-curricular activities. As a whole, the complete development with the focus on soft-skills, life-skills and career planning, will be a part of the holistic approach.

c. Path Traversed

Initially, TTTI Chennai offered Diploma in Technical Teaching (Dip. T. T) in Engineering. Later they started Bachelor in Technical Education (B. Tech Ed.) for the graduate teachers in Engineering. This programme was affiliated to the University of Madras. Later, the institute offered Diploma in Science Teaching (Dip. Sc.,) in accordance to the Kelkar Committee recommendations. The programme is offered through correspondence-cumcontact courses, since most of the science teachers of the polytechnics were deputed by

the Directorate of Collegiate Education of respective states. To overcome the bottleneck of administrative difficulty of deputing faculties for long-term, Diploma in Science Teaching helped to develop them. To accelerate the



Figure 3: Programmes offered in NITTTR Chennai

application of modern instructional methods in the polytechnics, certificate in Technical Teaching (Cert. T. T) and Certificate in Educational Teaching (Cert. E. T) programmes were introduced.

From the Certificate and Bachelor courses, NITTTR Chennai started offering M. Tech in Human Resource Development in the year 2000 and Ph. D Engineering Education offered from 1985 affiliated to University of Madras. The Department of Civil and Environmental Engineering started offering M.E Infrastructure Engineering and Management in the year 2019 and Ph. D in Civil Engineering in 2018, affiliated to Anna University.

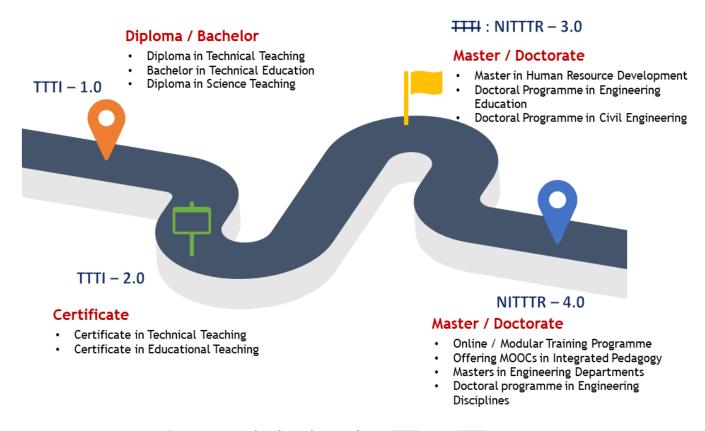


Figure 4: Path of evolution from TTTI to NITTTR

d. Current Activities

In carrying out the above mandate, the institute collaborates with the national and international institutes, universities and other agencies interested in and / or deriving benefits

from technical education and training. The focus of undertaken projects and programmes is clustered into five areas namely:



Figure 5: Major Activities of NITTTR Chennai

i. Education and Training

The priority of NITTTR Chennai, is organizing faculty development programmes (FDP) for the teachers of engineering colleges and polytechnics. In recognition of this, the institute planned and conducted a variety of short-term and long-term training programmes for teachers and staff members of the polytechnics, engineering colleges and industry professionals as well as teachers from overseas countries (international participants) to enable them to acquire competencies relevant to their respective areas of work.

In addition to the direct contact mode of training, NITTTR Chennai started to offer specialized courses through MOOC - SWAYAM.



Figure 6: Cluster of Continuing Education

Long-Term Training Programmes

Doctoral Research Programme

The institute continued vigorously to promote educational research programmes and encourage technical teachers, working personnel from industries and other education sectors to undertake research work in the areas of Engineering Education (Inter-disciplinary). The institute is a recognized Doctoral Research Centre of the University of Madras and Anna University, Chennai.

So far, a total number of **92** Ph.D scholars have been awarded Ph.D. degree in Engineering Education under the University of Madras. As on date, **16 and 8 Ph.D. scholars** have registered under the University of Madras and Anna university respectively.

Master's Programme

NITTTR Chennai started offering Master's programme from the year 2000, in the specialization of "Human Resource Development" affiliated to the University of Madras. As on date, around **45 students** graduated from this programme. The institute offers unique programme in the identified thrust area. From the year 2019, Department of Civil and Environmental Engineering started offering Masters in Infrastructure Engineering and Management, a specialized

programme with its unique syllabus affiliated to Anna University. This programme is exclusively designed, crafted and offered only in NITTTR Chennai. As on date around **30 students** are undergoing this programme. In the year 2020, institute got AICTE approval for starting three more specialized Masters Programme: (a) Electronics and Communication Engineering - Industry Integrated; (b) E-Learning Technologies; and (c) Technology Management. NITTTR Chennai wish to be the deemed to be university, so that more academic programmes could be offered in the thrust area and also has freedom in terms of redefining the curriculum and assessment pattern.

International Training Programme

NITTTR Chennai started offering the international training programme from the year 1982, as per the recommendation made by the **Dr. C. S. Jha Committee (1978).** The courses offered under the Indian Technical and Economic Cooperation (ITEC) programme of the Ministry of External Affairs, GoI and also various others schemes sponsored by the world bank, UNESCO and CPSC (Manila, Philippines). The ITEC Programmes are fully funded by the ministry of External Affairs, Government of India for training civilians from 161 developing countries in Asia, East



Figure 7: Participants represented from the Countries

Europe (including former USSR),
Central Asia, Africa, and Latin
America, the Caribbean as well
as Pacific and Small Island
countries. As a result, NITTTR
Chennai is actively involved in
conducting specially designed
training programmes under ITEC
programmes for the past 37 years

and there is now a great visibility and growing awareness among other countries about the

competence and services provided by NITTTR Chennai. Over the years, NITTTR Chennai has generated immense goodwill and substantive research collaboration among the developing countries of the world. The Centre for International Affairs (CIA) of NITTTR Chennai carries out the overall management of the programmes, whereas the respective course coordinators of the institute taking care of the academic aspects. As on date, more than 3000 participants trained from the 107 ITEC countries. During the pandemic period, NITTTR Chennai started offering e-ITEC programmes for various countries, we offered specially designed "Technology enabled Learning" courses for Maldives and "SDG & TVET" for the Kingdom of Eswatini in Africa.

Short-Term Training Programmes

The institute continued to implement the Government of India's scheme of Quality Improvement Programme (QIP). The main objective of the scheme is to improve the competencies of a large number of technical teachers of polytechnics and Engineering colleges through short-term staff development courses. Recognizing the need for technical teachers

and other staff members to enrich their knowledge and to keep themselves abreast them with the latest technologies, the institute organizes short term training courses of duration varying between one and two weeks. These training courses are continuously reviewed, modified and redesigned so that the ever expanding and changing needs of teachers are met.

COURSE STATUS

- Programme is offered in both Contact and Online mode.
- Increase in the number of programmes and participants.
- Programmes are aligned to the areas identified in the National Education Policy.
- Empowering learners in the five major clusters.
- Created great impact in the establishment of knowledge society

Polytechnic College Programmes

The specific training need of the teachers of the polytechnics in each of the southern States were identified through need analysis survey carried out by our Extension Centres and the State Directorates of Technical Education. The course details, duration and venue were finalized in Programme Development Committee (PDC) meetings, attended by the representatives of Directorates of Technical Education of the respective southern states. These meetings ensured that the courses planned, designed and conducted will cater the training needs of technical teachers of the southern region. These faculty development courses were organized at the institute headquarter in Chennai and its respective State extension centres located at

Hyderabad (Telangana), Vijayawada (Andhra Pradesh), Bengaluru (Karnataka) and Kalamaserry (Kerala). The participation of experts from industries and institutions of reputes such as IITs and CSIR laboratories enriched the effectiveness of the training courses. Industrial visits formed an integral component of majority of the training courses.

PRIORITIES

- Ensure the cost-effective training programme both online & offline
- Specialized courses in thrust area of global importance to enhance Personal and Professional skills.
- Improved social media presence
- Internship, Finishing school & graduate research programmes

During this year, the courses were conducted covering the following broad areas:

- Content updating in Engineering and Technology
- Quality Assurance and Accreditation
- Pedagogy Integrated Content Courses

- Refresher Courses
- ► Personality Development
- ► Induction Programme

As on date, **80,081** technical teachers from polytechnic system have been trained through **4247** courses.

Engineering College Programmes

The institute has also focused its activities to improve the quality of education in engineering colleges through training of teachers under sponsored category. From the year 2000, institute started offering pedagogy programme to the teachers of engineering colleges. The importance of what to teach and how to teach is emphasized through scientifically proven techniques. In the recent past institute offered special programmes to various institutes viz., National Institute of Technology, Tiruchirappalli, Manipur, Puducherry and Patna; IIIT's and various engineering institute of repute. Thus, till date, 28,231 technical teachers of Engineering colleges have been trained through 693 courses. The courses were conducted in the following areas:

- Instruction design and delivery system
- Outcome based education
- Student evaluation and question paper setting
- Personality Development and NLP
- Technology enabled teaching learning process
- Accreditation

Industries and Other Organisations Programmes

The institute has established good collaboration with the Government organizations and industries. The Government organization and industries are also availing the experience, expertise and resources of the institute for getting their engineers and staff trained. The

institute offered specialized induction programme to the newly recruited engineers of the government agencies viz., Tamil Nadu Housing Board, Tamil Nadu Slum Clearance Board, Tamil Nadu Pollution Control Board etc., Thus, to date, **2746 persons** were trained through

COLLABORATION

- Faculty / student exchange programme
- Collaborative research and continuing education
- Focus action towards and achieve the target of SDG's of United Nations.

122 courses. The activities carried out by the institute during the period 2000 - 2020 along with its achievements are presented graphically as follows:

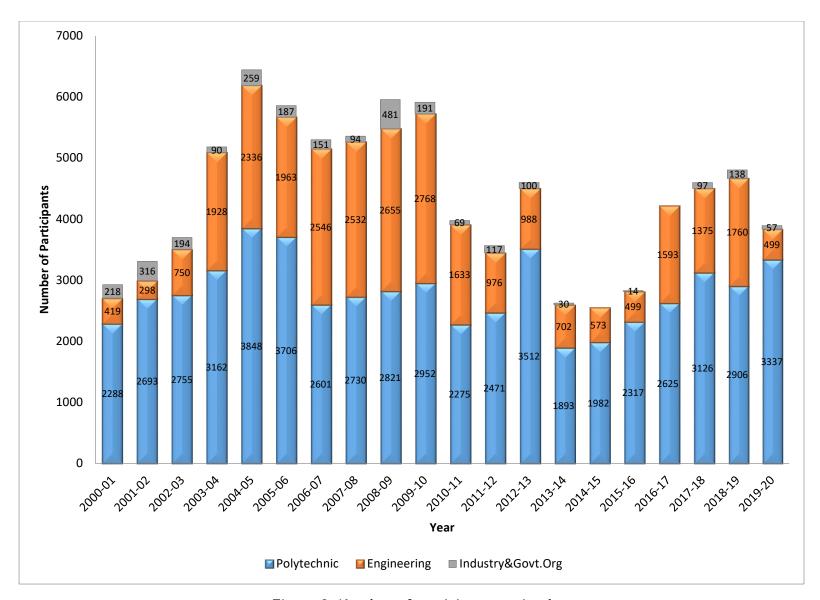


Figure 8: Number of participants trained

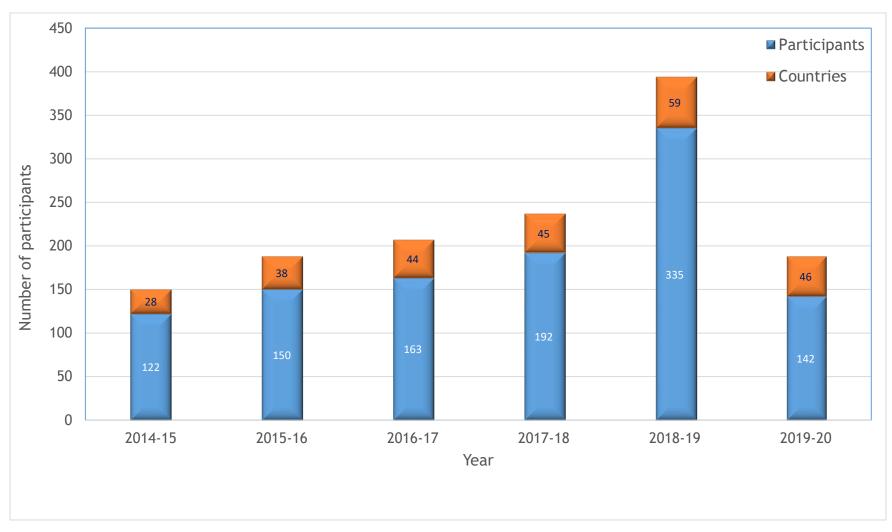


Figure 9: International Training Programme Offered by the Institute

ii. Curriculum Development

NITTTR Chennai involved in the curriculum development for the technician education and also contributed its expertise in the development of syllabus of technical universities. As per the recommendation made by *Prof. Jha Committee* (1978), institute involves in designing the curriculum for southern states technical institutions. NITTTRs were involved in designing new curricula in many emerging technology areas introduced in the polytechnic & engineering systems. NITTTR are also involved in developing model curricula and also in revising the existing curricula periodically at least once in three years. Many of the southern states have Curriculum Development Cells, so that the states themselves are able to design some of the curricula and revise the existing curricula on their own. During this period NITTTRs have trained officials of the Curriculum Development Cells in the States in the systematic methodology to design and review curricula. The expertise of NITTTR Chennai is also utilized in the international arena, through training programme and expertise service to the clientele system.

iii. Instructional Material Development

Instructional resources being developed include Teacher and Student support materials for technical institute, learning resources for in-house programmes, Video programmes for *Gyan Darshan* & Technology Channel, Curriculum based video programmes and Multimedia Learning packages, and Web based resources. In addition to preparing a number of Textbooks, Laboratory Manuals, Work Books, Readers, NITTTR has developed a number of transparency sets, slides, films, strips, charts, CAL Packages and Video Films. A number of experimental boards and kits have also been prepared by the NITTTR Chennai. NITTTR Chennai developed around 500 video materials under various technical topics and published around 30 books. The video material is uploaded in the institute YouTube channel.

iv. Research and Development

One of the major tasks of NITTTR Chennai is to study the problems faced by the Technical Education System and provide sustainable solutions. The research projects are undertaken in the areas of engineering and technology and also in the technical education by the faculty members of NITTTR in collaboration with teachers and other State Level agencies. A number of research project funded by World Bank, ADB, UNESCO, TNPCB and other funding agencies have been carried out and successfully completed.

v. Extension Services and Consultancy

The NITTTR Chennai undertakes extension services whereby they help technical institute in a number of areas like: Expert solution to the technical problems funded by Government and Private agencies, Laboratory Development, Improvement of Instructional Materials etc., NITTTR Chennai engaged the consultancy projects in a variety of areas, which can be categorized as under:

- i. Technical services to industry and community;
- ii. Training programme for industry professionals;
- iii. Education and management projects for the technical education system;

In the past one decade, more than 100 funded consultancy and other extension services carried out by the NITTTR Chennai to the tune of rupees one crore. List of projects along with funding agencies is provided in the Annexure 1.

e. Summary of Problems and Gaps

NITTTR Chennai to augment and redefine its role and responsibility periodically and to be contemporary in servicing the society towards establishing educational ecosystem, SWOT analysis is carried out. Based on the SWOT analysis, NITTTR, Chennai should be in the position to identify *where they are* and *how to proceed further*. In order to offer new mode training

programme, Master and doctoral research programme in the thrust area, improve the quality of education through accreditation, instill intellectual curiosity, scientific temper, creativity, spirit of services to the faculty members, brainstorming sessions were conducted during the institution day function held on 14 December 2018. Based on the discussion and deliberation, it is felt by the various stakeholders the role and responsibility of NITTTR Chennai need to get oriented towards attaining the deemed to be university status. It will facilitate the institute in the accomplishment, enlightenment and greater productive contribution to the society. NITTTR, Chennai will continue to ensure the high expectations, high achievement and it is reflected in everything what we execute.

Based on the SWOT analysis and the perceived Strengths, Weaknesses, Opportunities and Threats given by the NITTTR Chennai faculty members, a general summary of problems and gaps in the Institutes is listed below:

Issues in Training Programme

- Basic mandate of the institute being the development of technical education system, a
 declining trend in the quantum of training is seen due to inadequate sponsorship of teachers
 by the states mainly because of their inability due to shortage in faculty strength to spare
 and increase in the number of training programmes conducted by various allied agencies.
- Long horizon teacher training programmes eliciting poor response from the states due to non-recognition of these qualifications for career advancement. Lack of motivation amongst faculty members because of limited opportunities for career advancement.
- General decline in productivity in all functional areas due to resource crunch.
- Lack of training policy at the state level; induction programmes, training through STCs and
 LTCs are not mandatory for career benefits and advancement.

 Lack of training policy at central level making training mandatory for polytechnic and engineering college teachers in educational technology areas but there is no formal mechanism to make it regular and mandatory.

Proposed solution to issues in Training Programme

Based on the above-mentioned issues, it is felt NITTTR Chennai, will take a lead role in offering training programme at ease through Online mode (Synchronous or Asynchronous); Modular Mode; Blended Mode; and Remote Clusters. In this redefined mode of training, both the trainees and sponsoring authority is kept at ease with minimum interruption to the routine activities.

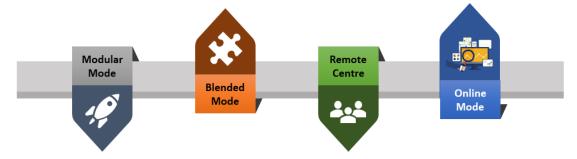


Figure 10: Mode of Training Programmes

In addition to this NITTTR Chennai wish to introduce Academic Bank of Credit (ABC) for

Training Programme. The participants will earn the credit and redeem to the credit requirement of professional degree programme. NITTTR Chennai proposed credit framework and also accreditation of the programme to facilitate in the credit transfer and recognition. This concept will provide flexibility to the learners, to have a holistic and multidisciplinary education and it aim to develop all capacities of human beings -intellectual, aesthetic, social, physical, emotional, and moral in an integrated manner.



Issues in Post Graduate & Research Programme

- While NITTTR Chennai do enjoy academic autonomy in training programme, administrative and financial autonomy, whereas in the Master's and Ph. D programme autonomy does not exist due to its affiliation to State Universities.
- NITTTR Chennai do have arrangement with local universities for certification (post graduate and Ph. D) of their programmes. But they have also to follow the regulations of the respective universities in formulating the programmes. This limits their ability to innovate and offer programmes in training areas in regular and modular form etc.

Proposed solution to issues in Post Graduate & Research Programme

Based on the aforementioned observation, NITTTR Chennai wish to adopt flexible system in the curriculum design and programme delivery for PG Programme. Education delivery would be

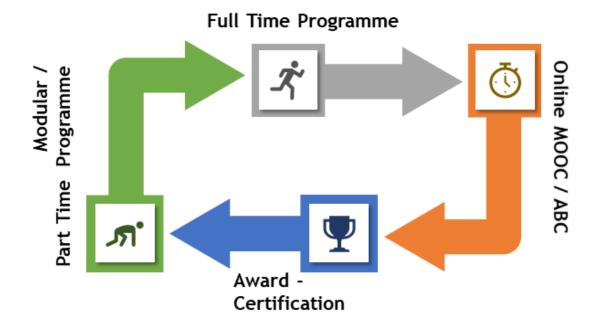


Figure 11 Graduation Pathway

through a blend of methodologies including face-to-face delivery in the usual class room mode, interactive learning and synchronous e-learning. The programme will be offered in full time; part-time; modular time; academic bank of credit transfer. Some international exposure shall be provided to students through collaborative projects with student groups in another country as well as industry internship with multinational companies abroad. Each student mandatorily audits several short duration cross-curricular capsule courses aimed at honing attributes such as creative thinking, problem-solving skills, communication skills, team-working ability, interpersonal skills, etc., Each student mandatorily undergoes one period of industry internship and work in collaborative research work. In case of ABC, the trainee who has taken up the synthesizing project after the training programme it will be considered for the total graduation credit requirement. Also, in order to hone the students problem-solving skills each course will have some activities in project form; and the full time student mandatorily audits a course on research methodology and also attends a whole host of extra-mural lectures on contemporary issues organized by the Institute at periodic intervals throughout the academic year.

NITTTR Chennai will be guided by the pursuit of excellence, engagement and simplification. It will be underpinned by values of courage and creativity, respect and integrity, inclusion and diversity, and openness and engagement.

2) VISION, MISSION & CORE VALUES

a) Introduction

The vision of NITTTR Chennai is to lay down future realistic goal of the Institute in catalyzing the regeneration of the training in meeting the demand of the clientele system. Tapping the potential of ICT and encompassing the need of present generation technical teachers, there is a strong need in imparting training in the cutting-edge technology and research output, which in turn get translated to the student community. Thus, to establish a unique identity for the development of high-quality human and knowledge resource.

b) Vision

The NITTTR, Chennai envisions to be a leading global institute in promoting excellence in Technical Education Systems by planning, designing, developing and offering quality training programmes, PG and doctoral research programme and also engage in consultancy and outreach activities to enhance the technical educational institutions, industry and community at large.

Our Short Vision Statement:

"Promoting Excellence in Technical Education"

c) Mission

The NITTTR, Chennai is a resource Institution established by the Government of India for quality improvement of Technical Education in the Southern Region of the country in particular. The following are the elements of Mission towards which the institute is committed to work:

* To offer quality, flexible, relevant and cost-effective training programmes for technical teachers in various modes.

- * To demonstrate leadership by organising dynamic and leading edge programmes to meet the changing needs of the industry and the community.
- * To develop into a degree awarding university in order to provide effective and efficient services to the technical teachers.
- * To help in solving problems in engineering education through research, development, and extension activities.
- * Develop needed Instructional Packages for the New and Industry Specific Programs

 (Print materials like Textbooks, Drawing Manuals, Laboratory Manuals, MMLPs,

 Educational Videos, Item Banks, Case Studies, & Capstone Projects).
- * To establish and foster collaboration with industry, state, national and international institutes, universities and other agencies committed to the development of technical education in the country.
- * Provide need-based assistance to developing countries in Asia, Africa, Oceania, Europe, Central and South America in planning the developing technical education programs through bilateral and multilateral agreements, or through funding from the International Development Agencies (IDAs).

d) Core Values

The following are the core values for our service to technical teachers and in turn to the students.

- Quality Education and Training
- Teamwork
- Staff Development for Continuous Learning

- Openness and Transparency
- Clientele Focus
- Social Responsibility

e) Functions of the Institute

Based on the provisions in the Memorandum of Association of NITTTR, Chennai, (Which are listed under the 'Functions of the Institute') the objectives of the institute has been formulated. They are listed below:

- To act as a centre for offering quality training programmes for teachers as per need of
 the client system, covering the entire gamut of technical education including
 polytechnics, engineering colleges, vocational and management education, at regional
 as also at national levels.
- 2. To arrange for practical training for technical teachers in industries on a collaborative education plan.
- 3. To undertake systemic research to provide research inputs for development of technical education training systems and its management.
- 4. To undertake action research for development of innovative methods, processes, and practices for improvement of teaching-learning environment in technical and vocational education institutions.
- To design new instructional system and strategies for production of multimedia learning materials.

- 6. To develop and disseminate learning resources like textbooks, laboratory manuals, video programmes, computer assisted instructional multimedia packages to technical and vocational institutions and other organisations.
- 7. To offer programmes for technical and vocational teachers in distance learning mode using state-of-the art technologies.
- 8. To offer courses / programmes for technical and vocational teachers to suit overseas demand especially SAARC and ASEAN countries.
- 9. To institute and award fellowship, scholarships, prizes, and medals for excellent technical teachers.
- 10. To collaborate with community and industry in organizing continuing and non-formal vocational education programmes and providing extension and consultancy services.
- 11. To undertake consultancy and extension work for industry, technical institutions / organisations.
- 12. To serve the states better by establishing Extension Centres of the institute in different States with the approval of the Govt. of India
- 13. To provide support services to Government of India schemes related to technical and vocational education system and as entrusted by the Ministry of Education, Government of India, from time to time.
- 14. To cooperate with educational or other institutions in any part of the world having objects wholly or partly similar to those of the institute by exchange of teachers and scholars and generally in such a manner as may be conductive to their common objects.

3) PERSPECTIVE PLAN FOR NEXT 15 YEARS

a) Introduction

NITTTR Chennai careful commitment to planning, in support of its mission sets us apart from many traditional technical institutes/universities. The broad vision and purpose of NITTTR Chennai positioned us to provide excellence in establishing manpower in the area of engineering education and provide seamless support to technical fraternity. Our key organizational units provide robust infrastructure, teaching and learning technologies, technical solutions and support, and information security to all areas of the technical institution.

Currently, the Institute has also greatly diversified from in - person training, to e-Learning and MOOCs accounting for more than 2,00,000 participants from all corners of the world. In carrying out its mission, the institute naturally places much emphasis on delivering learning-related products and services, on transferring knowledge, imparting skills and raising awareness with an aim to bring about changes in behavior, and to develop other capacities of its beneficiaries. Parallel to training, the Institute also engages in offering Masters Programmes and Doctoral Research in emerging areas. It also offers advisory support services to governments and other educational institutions at achieving broader social and economic development outcomes, such as developing institutional capacities.

By 2035, NITTTR, Chennai will be recognized locally, regionally, nationally and internationally as a knowledge provider of the highest quality training, teaching, and research to the fraternity of technical teachers through structured enriched programmes. NITTTR Chennai will be known as 'a great place to get educate, enrich and enhance the skills'. Our stakeholders will be delighted with the innovative industry-oriented curriculum, focus on technical, professional and higher skills and in the inspirational facilities. The services to clientele will be flexible, responsive and effective and the institute will enjoy very high levels of trainer's responsive

provision. NITTTR Chennai will continue to be at the heart of regeneration strategies in the southern region and work closely with the Directorate of Technical Education of the regional states. We will tap the potential of ICT in redefining the training and teaching.

This perspective plan serves as a guide to support our philosophy of leading through innovation while dedicating our energies to understanding the needs of our campus partners. Each of our past strategic plans served as a building block for our rapidly growing and evolving university. The focus of this plan guides not only instructional support tools, but the systems and services that create an outstanding infrastructure for learning and for our future.

b) Strategic framework of perspective plan 2035.

The strategic plan presented herein puts forth an overarching aspiration for institute, to be widely recognized as an internationally acclaimed institution for the development of technical education system and a model institute for design and delivery of programmes to address the teaching, learning and research needs of the system and bridge the industry academia gap. It aims at addressing the future preparedness of the NITTTR Chennai to match the driving forces of future Education and Training. The strategic framework of the plan include Strategic Initiatives and Development Strategies proposed, in alignment with Mission of the Institute, to achieve the Vision of the institute.

- It envisions being a nationally and internationally acclaimed model resource centre for teaching, learning and technology in technical education.
- It also envisions itself a leader in the innovative use of scholarly research in teaching and learning, in the innovative use of technology in support of teaching, learning

and scholarly activities, incorporate learning research and best practices in faculty development that promote quality course design and the effective integration of technology in teaching and learning.

- It aims to provide high-quality, mission-demand services to the MoE, Government of India and other international bodies.
- It shall offer academic programmes that are skill based and shall increase the employability passing out graduates and provide an interface between academia and industry.
- It aims at working towards achieving the target stated in the sustainable development goals especially goal number 4 of SDG Ensure Quality Education.
- It focusses all its activities towards the achievement of objectives stated in the National Education Policy 2020.



Figure 12: Strategic Plan - 2035 for different activities

Our intention to transform that experience, so that our students, faculty trainees will get empowered with skills that prepare them not only for the careers they can envisage now, but for a future that none of us can at this moment imagine. It would know that our insistence is to establish the University's culture must enable our strategy for excellence in education and research by creating an environment in which our staff and students can flourish. What, why, how with enablers the core activities will be implemented true to its spirit to make the deemed to be university of national importance.

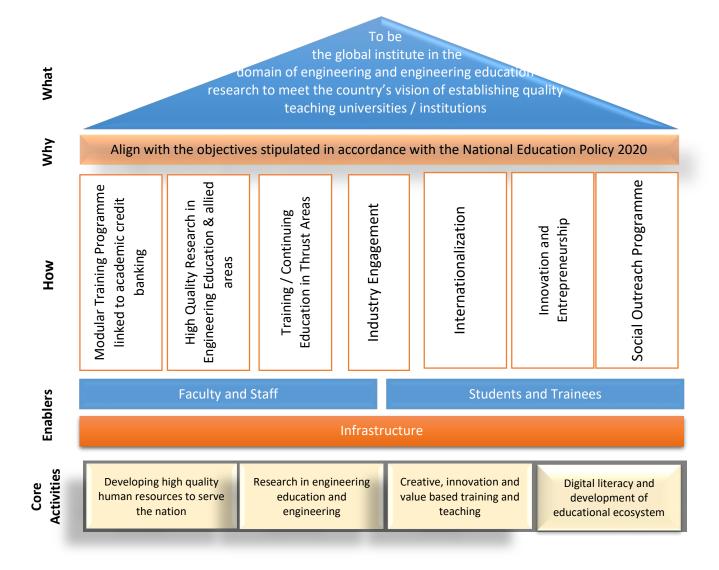


Figure 13: Strategy framework of NITTTR Chennai

c) Future Outlook

To enhance the NITTTR Chennai profile as world class Deemed-to-be University, there is a need for drafting the strategic directions. At present, the main focus is towards continuing education programme / quality improvement programme for the faculty members and also in the inception phase of master's and doctoral research programme in the core engineering. There exists a challenge which act as an opportunity to expand the services offered globally. To become knowledge Hub in line with Ancient India (Nalanda and Taxila), NITTTR Chennai will strive to expand the International training programme through ITEC and other funding sources to support the neighboring and strategically friendly countries.

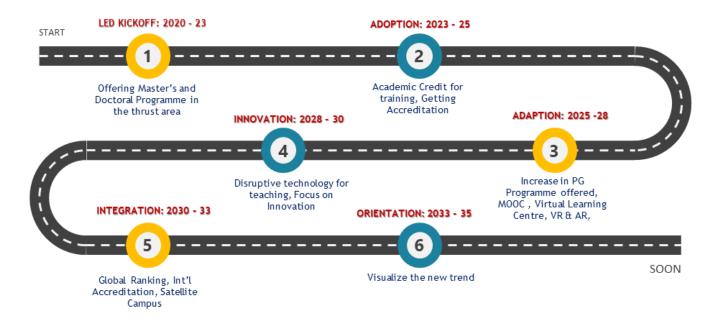


Figure 14: Perspective Plan 2035 of NITTTR Chennai

As discussed, NITTTR Chennai wish to offer training programme which are accredited and certified based on the examination. The short term training programme will be offered in the five major clusters (a) Foundation of Teaching & Learning; (b) Technology Enabled Learning; (c) Media and Information Literacy; (d) Professional Development Practice; and (e) Institutional Development Practice.



Figure 15: Cluster of Training Programmes

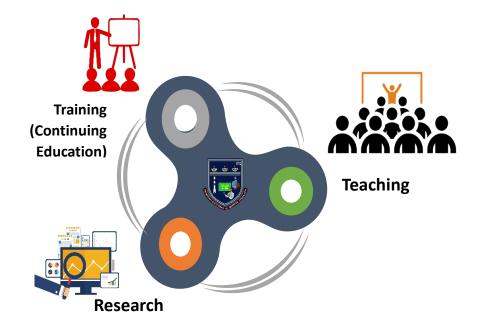
4) ACADEMIC PLAN

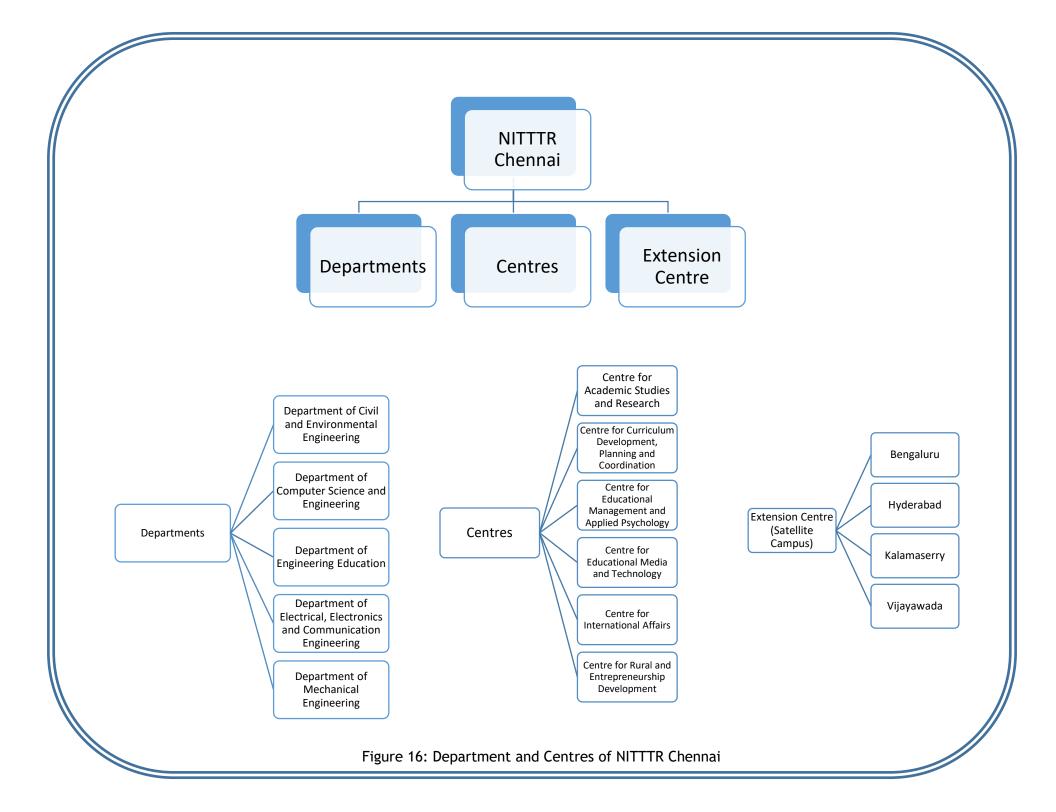
The NITTTR Chennai wish to establish the goal of creating a learning environment steeped in innovation and characterized by discovery, collaboration, inquiry, and engagement. For the past five decades, in the continuing education NITTTR Chennai was always in forefront in devising, designing and delivering the courses in the thrust areas. We always take pride in

demonstrating these values for our students and other clientele system in their academic and co-curricular experiences. We wish to take lead in new integrative approaches to teaching, research and outreach by developing meaningful partnerships and embracing innovation. NITTTR Chennai already expanded and stretched its wings to international community way back in the year 1982. The academic activities are carried out in the departments, centres, and extension centres (Satellite campus). The major cluster in the academic involves (a) Teaching; (b) Training; and (c) Research.

National Education Policy (2020)

The main thrust of the NEP is to end the fragmentation of higher education by transforming higher education institutions into large multidisciplinary universities and HEI Clusters/ Knowledge hubs.





a) Department & Centre /Extension Centre

The institute is grouped into (a) Departments; (b) Centres and (c) Academic Service Facilities / Units, which carry out faculty development, curriculum development, research, extension & consultancy services and other specialized activities. These departments and centres are well equipped. The academic contributions made by particulars of the performed by the various Departments and Centres are furnished below:

Civil and Environmental Engineering

The Department of Civil and Environmental Engineering is one of the oldest department created to offer programmes in the area of civil engineering and other emerging areas., viz. Sustainable Construction, Smart Infrastructure, Sustainable Geotechnics, VR / AR in Civil Engineering, GIS Applications in Civil Engineering, Drone Surveying, Free and Open Source Software in Civil Engineering, Disaster Management, Building Information Modeling (BIM), Teaching Engineering Mechanics, Design of Steel Structures, Geotechnical Engineering, Earthquake Resistant Structures, Design of RCC Structures, Design of Bridges & Irrigation Structures, Strategic Planning and Institutional Development and Outcome Based Education and Accreditation. The Department has also conducted International Training Programs in Spatial Information Technology for Urban Planning and Management, GIS Applications in Natural Resources Management, Quality Assurance in Technical Education of Developing Countries, Quality Assurance and Accreditation in Technical & Higher Education, Leadership for Academicians of Higher Educational Institutions (Vice Chancellors, Deans and Directors of various Institutions of Afghanistan), Sponsored by Indian Technical & Economic Cooperation (ITEC) programmes. The Department has been identified as National Resource Centre by the Ministry of Education, Govt. of India and offered Annual Refresher Program in Teaching (ARPIT), offered courses in Civil Infrastructure for Smart City Planning; and Sustainable Construction Materials and Techniques. The department has offered more than 10 programs in MOOCs under SWAYAM Platform. The

department is offering PG Programme in Infrastructure Engineering and Management, and doctoral research in the area of Civil Engineering. The department also offers several training programs in the areas of Training of Trainers in Civil Engineering for Engineers and Officials of various state and central Govt. organizations.

The department would also engage in fundamental research with a view to develop newer problem solving methods and to apply these to creative design scenarios in contemporary and emerging technologies. It would also offer consultancy services and conduct continuing education programs for working professionals in its areas of focus. The following laboratory exist in the department of civil and environmental engineering:

- A) Material Testing Laboratory
- B) Structural Engineering Laboratory
- C) Geotechnical and Geo-environmental Testing Laboratory
- D) Environmental Engineering Laboratory
- E) Non-Destructive Testing Facility Laboratory
- F) Surveying & GPS Laboratory
- G) Computer Suite 30 Systems loaded with software's related to Civil Engineering
- H) Immersive Technology Laboratory for Civil Engineering Application
- I) CAD / Project Management Laboratory.

Computer Science and Engineering

The Department Computer of Science and Engineering was established in the year 1985 as Computer Centre to offer training programmes in the domain of software and hardware systems. Later, Computer Centre renamed as the Department of Computer Science and Engineering to focus on building the intellectual capital of the Engineering Education society. The department has been offering training programmes in different clusters such as emerging areas, refresher programmes, curriculum development programmes and programme for IT

professional from Industries. The department partnered with leading IT government organizations, IT industries and leading academic institutions. The department step into international training programmes from the year 2001 to train the IT professionals of ITEC countries through the Ministry of External Affairs, Government of India. The department is having high-end laboratory facilities in different domain to train the professional with concrete concept. The following laboratory exist in the department:

- A) Programming Laboratory / Application Development Laboratory
- B) Data Analytics Laboratory
- C) Linux Laboratory / System Administration Laboratory
- D) Cloud Computing Laboratory
- E) System Hardware Laboratory
- F) Network Laboratory / Cyber Security Laboratory
- G) Data Centre
- H) Campus-wide Wi-Fi Networking

Engineering Education

The Department of Engineering Education has been growing in terms of expertise development in pedagogical training and also extended its horizon to Human Resource Development, Engineering Pedagogy, Educational Psychology, Soft Skills, Training Persons with Disabilities, Engineering Education Research and Women Empowerment. It is one of the key service Departments of the institute. It has been conducting a large number of short-term programmes in the areas of Instruction Design and Delivery System, Communication Skills, Outcome Based Education, Soft Skills, Guidance & Counselling, Student Evaluation and Gender Issues. The Department has coordinated M. Tech(HRD), B.Tech (Ed) and M.Tech (Ed) and Dip.T.T Programmes. It has coordinated several training programmes for Engineering college teachers in the areas of IDDS, Student Evaluation, NLP and Guidance and counseling.

Electrical, Electronics and Communication Engineering

Established in the year 1964, Electrical, Electronics & Communication Engineering Department is organizing about 30 programmes per the year in 20 different areas for teachers of Polytechnic and Engineering Colleges from the Southern Region of India. The Department is conducting Overseas Training Programmes every year for two months' duration to train the Overseas teachers in the emerging electronics areas. Training programmes organized in the department are practically oriented to enable the participants to gain confidence in handling the subjects. The training will be given by the eminent Professors, Experts and related Software Professionals from various Universities, IIT Madras, and Industries. Participants will be getting industrial exposure by arranging industrial visits and training in the industrial environment. The Department has offered customized training programmes for Industries like Andrew Yule, Visteon and has also trained PWD officials. As per NITTTR Chennai mandate, the Department faculty members are involved in revising the curriculum of Polytechnic and Engineering colleges from time to time. The Department is organizing many workshops / seminars / conferences in emerging areas in the field of Electrical, Electronics and Communication Engineering. The Department has conducted International/National Programmes/ workshops/ Seminars in collaboration with CPSC Manila (Philippines) and UNSECO. The Department also offers consultancy in setting up of Centres of Excellence and other project works. The department has purchased the latest equipment's to train the faculty members in the current trends. The following laboratory exist in the department:

- A) Programmable logic controller (PLC) lab
- B) Micro controller lab
- C) Application software lab
- D) Power electronics lab
- E) Communication engineering lab
- F) Bio-medical instrumentation lab
- G) VLSI lab
- H) Industrial instrumentation & pneumatics lab
- I) IoT cloud research lab

Mechanical Engineering

The Department of Mechanical Engineering provides academic leadership in content updating courses in existing and emerging technology areas through short-term courses and assists the client institutions in modernization and removal of obsolescence of physical resources. The Department provides required support to various projects and activities including those related to curriculum development, teacher training and preparation of instructional materials, laboratory innovations in the area of Mechanical engineering and allied disciplines. The following laboratory exist in the department:

- a) Additive Manufacturing
- b) Electro thermal NTM Processes Laboratory
- c) Cryogenic Machining
- d) Renewable Laboratory

Academic Studies and Research

Centre for Academic Studies and Research was established in the year 2018 as a Centre of Excellence, which aims at providing high quality solutions to the problems in core Engineering and Engineering Education through research, development and extension activities. This centre is facilitating with the various Departments / Centres in Masters and Doctoral programmes in core engineering and engineering education.

Curriculum Development, Planning and Coordination

CCDPC founded in the year 1964 by the institute coincided with a growing national requirement in the technical education sector. Since that time, CCDPC has been a vital force in bridging research, policy, and practice in the following ways:

• Pioneer in creative and framing the curriculum for the technical institutions (Polytechnic and Engineering) in collaboration with the industries to meet the demands of the society;

- Facilitating faculty development programme and renewal of knowledge through curriculum mapping;
- Collaborating with faculty on institutional quality assurance initiatives, including academic program review, academic auditing, feedback on courses and new and revised, assessing the efficacy of new mode of instruction.
- Liaison with the state technical education in implementation of various schemes for the welfare of the society.
- Forerunner in faculty and workforce development with learners of all ages around the world
- Internationally recognized centre in offering extension services in the area of academic institutional development.

Training programmes organized in the centre are practically oriented to enable the participants to gain confidence in framing, designing, and implementing the curriculum as per international protocol. The concept and framework for Academic Bank of Credit for the training programme is proposed by the Centre and acts a bridging agent to the institute and clientele system.

Educational Management and Applied Psychology

The Centre for Educational Management and Applied Psychology organizes need based Short-Term courses to the Technical teachers belongs to all branches. The Centre also offers Ph. D. programme (Engineering Education - Inter-disciplinary), affiliated to University of Madras. The Centre proposes to offer One Year P.G Diploma in "Guidance and Counseling" by direct mode in the next academic year (2020-21). The department conducts FDP courses on the following titles, Soft Skills, Leadership and Management Skills, Academic Leadership Development for Principals, Counseling for student development, Life Skills Development, HRM in Technical Education, Application of Digital Technology in Research, HRD in Technical Education,

Employability Skills for Youth, Quality Management system / TQM in Technical Education, Educational Measurement & Evaluation, Writing Research papers in Technical Education, Motivation and Attitude development, Behavioral Assessment of Students.

Educational Media and Technology

The Centre for Educational Media and Technology (CEMT) designs and develops need-based training programmes on emerging areas of Educational Media and Technology for the teachers of technical institutions. The Centre coordinates various international trainings under the sponsorship of Indian Technical Economic Cooperation, Ministry of External Affairs, Government of India and other sponsoring agencies. In addition to that the Centre coordinates Skill-based trainings for the faculty of Polytechnic and Engineering Colleges. The Centre designs and develops educational resources for various online learning platforms such as NMEICT, SWAYAM, ARPIT, and NITTT. This centre was established since the inception of the NITTTR Institute at Chennai in the year 1964. The first sophisticated educational studio was established for Southern India at NITTTR Chennai in 1980's. The Educational Studio has the honour of live telecasting lecture programmes. The developed video programmes were broadcasted via DD Gyandarshan and other educational channels.

The CEMT is conducting Overseas Training Course in Advanced Certificate Course on Educational Media Production for E-Learning sponsored by ITEC and MEA. The centre offers Master degree programme in the area of "E-Learning Technologies" affiliated to Anna University, approved by the AICTE.

International Affairs

The Centre for International Affairs coordinates the international training programme offered under the sponsorship of Indian Technical Economic Cooperation (ITEC), Ministry of External Affairs, Government of India and other international sponsoring authorities. NITTTR Chennai

started offering the courses from the year 1982 and has a global presence in more than 106 countries through their international training courses. All the international training programme are structured towards strengthening knowledge domain and in turn creating a fertile environment to the participants. We are distinctly qualified to offer comprehensive, customized professional development and training programmes by drawing from the unparalleled range of content, cutting edge technologies, and services in the field of engineering education. Our unique mode of training provides innovative learning solution that in turn helps the institution to empower their faculty members, enhance institute brand, drive results, and improve the overall efficiency of the institution in making of enhanced knowledge society. In addition to training programme, the centre coordinates bilateral research and academic programmes with International Institutions/Universities through Memoranda of Understanding (MoU), Exchange of Faculty/Students, and conduct of International Joint Seminars/Conferences.

Rural and Entrepreneurship Development

To enable the project personnel associated with the implementation of Community Development through Polytechnic scheme in their respective polytechnics, the Centre for Rural and Entrepreneurship Development (CRED) of the institute serves as a resource centre. The Polytechnics carryout the activities based on the Annual Operation Plan approved by the NITTTR Chennai. It conducts orientation training programmes, workshops and annual review of the scheme to verify Physical Achievement Report. Besides, the CRED assists the MSDE in preparation of various progress reports and the expenditure related matters.

It is recommended that at its inception the Institute has the following independent Academic Service Facilities/Units: (i) Central Library; (ii) Computer Centre; (iii) Workshop; (iv) Virtual Learning Centre; (v) Classroom Complex; and (vi) Conference Centre-cum-Auditorium.

5) FACULTY RECRUITMENT PLAN

a) Introduction

The strength of the academic institution is to attract quality faculty members to build and be a part of the system. At present, in the NITTTR Chennai the sanctioned strength of the faculty members is 47. The vacancy needs to be filled with quality faculty members who exhibit belonginess to the system. NITTTR Chennai, location had advantage due to the industries and

IT Sector in and around the campus. The recruitment plan will be in accordance to the guidelines stipulated by AICTE and MoE from time-to-time. The Institute will appropriately recognize different types of experience, in academics, industry, and research institutions. The conducive professional and

NEP -2020 states HEIs will have clearly defined, independent, and transparent processes and criteria for faculty recruitment. Whereas the current recruitment process will be continued, a 'tenure-track'.

residential environment have been created to recruit faculty members from all over the world. At present, the proportion of women in the faculty is about 16 percent. A method of assessment is being evolved that is transparent, credible and fair. Underlying this system is a basic belief that each faculty member must excel in a combination of dimensions according to his or her preferences.

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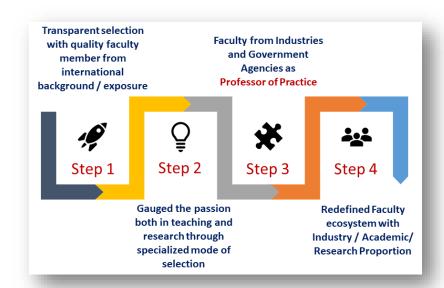
NEP 2020 emphasis Excellence will be further incentivized through appropriate rewards, promotions, recognitions, and movement into institutional leadership. Meanwhile faculty not delivering on basic norms will be held accountable.



b) Recruitment - to meet the long-term plan

To meet the demand towards offering new graduate programmes, there will be augmentation in the faculty strength. It is proposed to start nine post graduate programmes, in the regular and modular mode. The demand will be met from the revenue generated and also from the

grant received. As stated in the NEP 2020, the faculty recruitment will be aligned accordingly and in the next five years, the additional faculty strength required will be 40. (Professor - 08; Associate Professor - 12; Assistant Professor - 20).



c) Rollout plan for next five years

As specified in the perspective plan

for 15 years, it is visualized to increase the faculty strength from 47 to 87 faculty members. In the next five years, the rollout plan in terms of specific objectives and targets is listed below:

- To recruit around top-class faculty members with the focus on engineering education and various Engineering disciplines.
- To provide a flexible rewarding path for promotion and appreciation.
- To provide seed money for the newly recruited faculty members to facilitate the research.
- To provide excellent ambient in workplace & residential area.
- To provide avenue to the faculty members to collaborate with international and national
 experts from reputed institutions and motivate them to submit research proposal for
 possible functioning submit minimum two proposals per faculty per year.
- To recruit industry experts as Professor of Practice / Adjunct faculty, with the target minimum one faculty per department in the next two years.
- To reward high-achieving faculty members once every five-six years.

6) STUDENTS ADMISSION PLAN

a) Introduction:

NITTTR Chennai in alignment with the National Education Policy 2020, focus towards increase in the Gross Enrolment Ratio from 26.3% to 50% by 2035. To provide admission process in equitable manner, institute strive to follow the procedure laid by the academic council from time to time. The admission criteria for Master's and Doctoral students are clearly stipulated to encourage highly motivated students to have access to affordable quality education. The institute has a strong international base through its successful ITEC training programmes conducted over the past 36 years. More than 3000 faculties / administrators from 110 developing countries are trained through various short-term and long-term programmes.

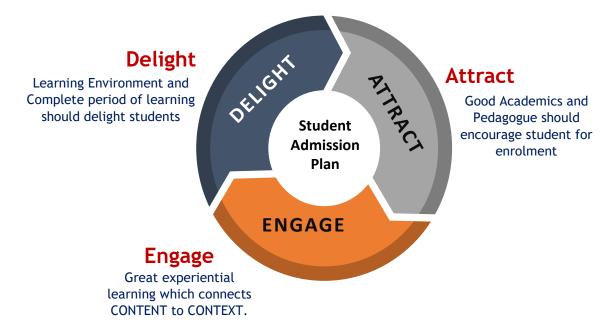


Figure 17 Student Admission Plan Strategy

NITTTR Chennai proposed to offer nine post-graduate programmes, doctoral research programme and exclusive working executive programmes. The credits accumulated in accredited training programmes may be transferred to obtain degree programmes. The entire admission process coordinated through Centre for Academic Studies and Research, whereas the equivalency for training credits is approved through Centre for Curriculum Development,

Planning and Coordination. All the programmes encourage to work in the thrust area and interdisciplinary in nature.

All admission is carried out only through online process in exclusive NITTTRC-ADM portal.

b) Programmes offered:

i) Post Graduate - Master Programme:

At present, AICTE has approved following three Master's Programmes affiliated to Anna University, Chennai.

- a) Infrastructure Engineering and Management
- b) E-Learning Technologies
- c) Electronics and Communication Engineering Industry Integrated

The institute proposed to offer the following Masters programmes in addition to the above mentioned three programmes soon after the approval of Deemed to be University Status.

- a) M. Tech in Learning, Design and Technology
- b) M.Tech in Autotronics
- c) M.Tech in Cognitive Computing
- d) M.E in Education for Sustainable Development
- e) M.Tech in Smart Infrastructure Engineering and Management
- f) M.Tech in Society 5.0
- g) MBA in International Education Policy
- h) MBA in Educational Transformation

ii) Doctoral Research Programme

At present, NITTTR Chennai is approved as the research centre for Civil Engineering by the Anna University and for Engineering Education research by the University of Madras. At present eight scholars are working in the domain of Civil and Environmental Engineering and 14 scholars are working in the area of Engineering Education.

- c) Minimum qualification for admission:
 - i) Post Graduate Master Programme:

At present, institute is admitting students based on bachelor's degree in respective branch of study and GATE / Tamil Nadu Common Entrance Test (TANCET) Score.

It is proposed to follow:

- Candidates should have graduated with a full-time bachelor degree from any recognized University/Institute with a minimum aggregate of 60% of mark or equivalent CGPA.
- Candidates appearing for their final degree / semester exam in the current year are also eligible to apply.
- The candidates should produce statement of final year marks and provisional degree certificate.
- The applicant for admission should be a Resident Indian National and should have graduated from Institutions located in India. If the applicant is foreign national or NRI, then the norms stipulated for international admission will be applicable and the office of Centre for International Affairs, NITTTR Chennai may be contacted

PROGRAMMES	ELIGIBILITY
Smart Infrastructure Engineering and Management	B.E/B.Tech. Degree in Civil Engineering / Civil & Structural Engineering or any equivalent degree
Education for Sustainable Development	B.E/B.Tech. Degree in any discipline
Society 5.0	B.E/B.Tech. Degree in Electrical / Electronics / EEE / ECE / E&I or any equivalent degree
Learning, Design and Technology	B.E/B.Tech. Degree in any branch / M.S or M.Sc., in Computer Science / IT / Electronic Media / Visual Communication / Mass Communication / MCA or any equivalent degree
Cognitive Engineering	B.E/B.Tech. Degree in any branch / M.S and M.Sc. in Computer Science or IT or Software Engineering / MCA or any other equivalent degree
Autotronics	B.E/B.Tech. Degree in Mechanical / Production / Manufacturing / Automobile Engineering or any equivalent degree
International Education Policy	B.E/B.Tech. Degree in any discipline
Educational Transformation	B.E/B.Tech. Degree in any discipline

ii) Doctoral Research Programme

At present, institute is approved as the research centre for Civil Engineering by the Anna University and for Engineering Education research by the University of Madras. The admission guideline stipulated by the respective affiliating university is followed. For the NITTTR Chennai deemed to be university, the doctoral research admission is based on the following guidelines, whereas in the case of twinning programme with international institutes the guidelines mutually accepted is applicable.

- Master's degree in Engineering/Technology in the relevant discipline with a first class or a minimum of 60% marks / CGPA 6.5 on a 10-point scale in cases where letter grades are awarded or Equivalent qualifications like M.Sc. (Engineering) / M.S. [By Research.] / M.Tech [By Research] / Integrated M.Tech / M.S.].
- For all the Research Programmes, it is mandatory that the candidate should have studied in regular, full time and formal education in their previous degree programmes (UG and PG)
- For Integrated Ph.D. in Engineering/Technology: Bachelor's Students from the institute
 of national importance with outstanding academic record in the Bachelor's degree in
 Engineering Technology with an aptitude towards advanced scientific and technological
 research are eligible to apply. A minimum of 80% marks or a CGPA of 8.0 / 10.0 scale is
 mandatory.

d) Selection Procedure for National / International / NRI Candidates:

- Candidates of Indian National, whose selection is based on PG mark, Statement of Research
 Proposal (SoP) as per the given template and interview.
- Candidates of foreign nationality who hold Degrees from the Indian Universities seeking admission to Doctoral Research Programmes with the necessary clearance from the Government of India (The Ministry of Education / Ministry of Home Affairs) and possess valid

VISA will be treated at par with Indian nationals for the purposes of admission to the Institute.

- Indian nationals having degrees from Indian Universities may apply as NRI candidate. After receiving their application and required documents, they will be interviewed via online.
 The fee is payable only on US\$.
- Foreign nationals with foreign degrees must meet the minimum educational requirements of NITTTR Chennai as stated for the programme. Their degrees must be equivalent to Indian degrees mentioned in Engineering/Technology/Science and they should have a good academic record. International Students are expected to have a good working knowledge of English. Candidates with valid GRE and TOEFL scores will be given preference. The case of each foreign applicant will be examined and admission will be offered purely on merit.
- Foreign nationals / NRI candidates can only register as full-time candidates / scholars.

e) Fee Structure

S.No	Programme	Existing Univ. of Madras Programme In INR		Existing Anna University programme In INR		Proposed Deemed University Programme	
		Part-time Teaching	Part-time Industry	Institution	Hostel	Institution	Hostel
1.	Post graduate	-	-	Rs.30000/-	Rs.10000/-	Rs.50000/-	Rs.25000/-
	programmes (National)						
2.	PhD programs	Rs.20000/-	Rs.40000/-	Rs.27000/-	Rs.10000/-	Rs.50000/-	Rs.25000/-
	(Full Time)						
3	PhD Programs	-	-	-	-	Rs.40,000/-	Rs.25000/-
	(Part						
	Time)(QIP-						
	Teacher						
	Candidates)						
4	PhD Programs	-	-	-	-	Rs.1,00,000/-	Rs.25,000/-
	(Industry						
	Sponsored						
	Candidates)						

S.No	Programme	Existing Univ. of Madras Programme In INR		Existing Anna University programme In INR		Proposed Deemed University Programme	
		Part-time Teaching	Part-time Industry	Institution	Hostel	Institution	Hostel
5	Post Graduate	-	-	-	-	1500 US\$	1000 US\$
	Programme						
	(International)						
6	PhD Programs	-	-	-	-	2000 US\$	1200 US\$
	(International)						

f) Projected Student Strength in the next five years (2021 - 2026)

PROGRAMMES	2021-22	2022-23	2023-24	2024-25	2025- 26	Total
Master's Programme • (A total of Eight Programme / Each programme 18 students, however in the first year only four programmes are offered)	72	216	288	288	288	1152
Master's Programme • Executive Programme	20	20	20	20	20	100
Master's Programme • Transfer of Credit (Academic Training Credit Bank)		10	20	100	100	230
Doctoral Research	10	40	40	40	40	170
Total	102	286	368	448	448	1652

g) Rollout plan for next five years

The success of the institute depends on its research programme and transferring the technology into reality. NITTTR Chennai involved in the Ph.D in Engineering Education from the year 1985 and Ph.D in Civil and Environmental Engineering from the year 2004. When the institute is declared as deemed to be university, the focus of research will be as listed below:

- To produce Masters and Ph.D. graduates with high employability. The graduates will be tuned towards research to fit into Teaching Universities, as per NEP 2020.
- To make significant contributions to the engineering education and technology for nation building.
- To initiate Ph. D and Master twining programme with the international universities before the year 2022.
- To achieve a Ph. D + Master graduation rate of 0.5 + 0.5 per year per faculty member and collaborate in the graduation of international students by the year 2023.
- To publish a large fraction of papers in high impact factor journals where peers in the top 50 universities publish and a minimum of one paper publication per faculty per year
- To nurture the unique strength of NITTTR Chennai in engineering education research and institutional development leading to a campus, which develops students with immediate societal value
- To establish at least one research centre of excellence before the year 2022, built around focus themes in engineering education which should be known globally for the societal impact.

7) RESEARCH PLAN

a) Introduction

NITTTR Chennai has strong industry and educational institution linkages. For the past four decades, NITTTR Chennai actively involved in developing curriculum sponsored by the World Bank, ADB and other national and international sponsoring agencies. The overall strategy for developing sponsored research and industrial consulting activities in the core engineering at NITTTR Chennai increased multifold after the year 2009. The new collaborative research projects with relevance to the nation and of interest to link industry with academy was

vigorously undertaken. The faculty of the Institute are placed in a matrix structure with dual coordinates: one in a Training / Teaching dimension and another in a Research / consultancy dimension. NITTTR Chennai wish to research on the teaching dimension and translate to the society through its networking.

...to be a research university of choice for outstanding students, faculty and staff from NITTTR Chennai and the world. We aspire to be the university that best integrates outstanding scholarship, inspired teaching and real-life involvement. As members of a diverse and dynamic learning community, we challenge one another to become thoughtful, engaged citizens and leaders, prepared to contribute to the betterment of a rapidly changing global society.



NEP 2020 emphasis HEI's will focus on research and innovation by setting up start-up incubation centres; technology development centres'; centres in frontier areas of research; greater industry-academic linkages; and interdisciplinary research including humanities and social science research.

The faculty belonging to a department are expected to teach core/elective courses pertaining to the programmes offered by the department. With respect to the Research dimension, there are no departmental boundaries/restrictions, i.e., the faculty enjoy complete freedom to

pursue collaborative research, undertake joint guidance and send joint research proposals. The Institute funded inter-disciplinary projects involving faculty across multiple departments in order to seed and explore new thrust areas.

b) Programmes (Engineering and Engineering Education)

NITTTR Chennai emerged as national hub for the technical teacher training. The Ministry of Education, GoI nominated NITTTR Chennai as one of the National Coordinators of SWAYAM for the Teacher Training. In this regard, the research will be focusing on developing the framework for rechristening the training courses and facilitate towards academic credit transfer. To flourish in the research conducive environment, people and system need to be established or nurtured. The research strategy is as follows:

Our Infrastructure	Our Research
Resource focused on targeted world-class facilities Concentrating specialized facilities in natural precincts viz., VR, AR & Other thrust areas Recognising and supporting specific campus and regional needs Linking physical learning and researchspace, library, and other planning to support research	Research aligned to SDG No. 4 - Quality Education Department / Centre to provide the best and most supportive research culture Thematic focus to recognise, or establish, beacons of excellence Individual academic passion is our foundation for research. Seed money is provided.
Our People	Our Systems
Attracting, retaining, supporting and nurturing the quality faculty and scholars	Collegial and open research governance
Enhancing the higher degree student experience	Resourcing and incentivising research activity through strategic investment
Internationally engaged through thematically aligned networks	Professional, responsive and targetted operational support.
Extending our capability and	
capacity through partnerships & Collaboration.	Facilitating in the process of IPR (Patent and Copyright)

NITTTR Chennai already produced more than 92 Ph.D scholars in the Engineering Education, affiliated to University of Madras from the year 1985. There is need to change in the

perspective of ongoing engineering programmes and the faculty members need to visualize the diverse learners, the effects of rapid technological advancement and globalization in their teaching profession. The transformation of engineering education is focused towards the research based

As suggested in National Education Policy
2020: the research will focus towards
improving and developing sustainable
education at Teaching Intensive
Universities

discipline rather than one, based on tradition or unproven methodologies. The focus of engineering education research will be clustered as shown below:

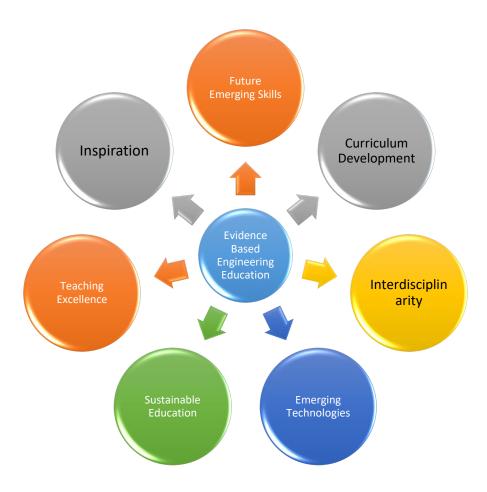


Figure 18: Research Cluster in Engineering Education

c) Rollout plan for next five years

As stated above the strength of institute lies with the engineering education and research, the future needs conceptually sound engineer to tackle problem with solution from multidisciplinary output. In accordance to NEP 2020, the institute will emerge as a hub for multidisciplinary university, which cater to the need of developing sustainable education ecosystem. The manner in which the future engineering skills required and role of teachers need to play its achieving this need and to focus on dynamic nature of sustainable curriculum. The institute in next five years roll out plan towards research excellence encompasses:

- To embark on the impact making research that addresses major challenges faced by the technical institutes in establishing knowledge society.
- To increase the number of faculty members involved in the interdisciplinary research in engineering education to 75 percent of the total faculty strength.
- To promote the passion for involving in the sponsored research to 75 percent of the total faculty strength and in consultancy to 60 percent.
- o To increase the value of total funded research to approximately 2 crores per year
- To increase the number of industry-driven projects by 100 percent and involve in all the continuing education programme.
- To establish the state-of-art innovation park to provide solution to the educational institutions issues with strong international NITTTR Engineering Education community/alumni.
- o To increase the number of patents and copyright applied annually.
- To commercialize the teaching / research innovations and serve as a think tank to educational service providers.
- To encourage "idea to product" pre-incubation activity involving faculty and students
- To grow to a level at which two new companies are incubated each year
- To offer exclusive entrepreneurship to working professionals and train around 1000 professionals in the next five years.
- Through NITTTR Community, transform 25% educational institutions through collaborative research programme of societal importance by involving communities.

8) NETWORKING PLAN

a) Introduction

The network planning activity is structured in a way it is connected to the strategic goals and directions of the institution. It is to create a means for cooperative efforts between NITTTR Chennai and Collaborating institute / industries / organization to promote the academic and exchange of faculty, postdoctoral fellows, and doctoral students, and academic and research information between the two Institutions. NITTTR Chennai promotes networking in two aspects: share its expertise with other technical institutions in developing better educational ecosystem; and to enhance its own academic and research capabilities. The main motto behind the networking plan is SHARING and CARING. NITTTR Chennai wish to collaborate and strengthen the alliances, some of the major plans to boost networking and engagement with industry and institutions are listed in the following paragraph.



Figure 19: Networking of NITTTR Chennai

NITTTR Chennai is committed to transform how we teach and learn. We are committed to supporting fundamental and applied research as well as collaboration across research disciplines. We strive hard to improve the quality of technical education, through undertaking projects (Research & Consultancy) with the technical institutes in terms of complete diagnostic studies. Finally, the institute will suggest various academic measures so as to improve their quality in imparting best and sustainable education. The NITTTR Chennai is uniquely positioned to produce talent and knowledge to drive societal, environmental and economic well-being of technical education institutes. It has a strong industries and government agencies linkages. It extends symbiotic relationship with institutes of national importance and other state technical universities / institutions.

b) Networking through MoU

NITTTR Chennai has signed MoU with Academic Institutions, International Training Institutes, and Industries. We entered into cross-disciplinary affiliation agreements (MOUs) to support new partnerships for engaging in joint research and innovative applications of teaching-learning process, as well as training and capacity building towards developing knowledge society. It promotes outcome-oriented MoU with industries, research, and academic institutions.

A strategic partnership can improve synergies for both beneficiaries and contributes to an overall increase in institutional competency. Through MoU, there is a possibility to excel in training needs and in turn innovate and share best practices. Through partnerships with governments, academies and industries it makes it possible for NITTTR Chennai to consolidate and extend its capacity to provide a global platform for knowledge transfer. The following table list the institutions entered into MoU with NITTTR, Chennai

Sl. No.	Name of the Institutions			
	INTERNATIONAL			
1	Colombo Plan Staff College (CPSC), Manila, Philippines			
2	Training Institute for Technical Instruction (TITI), Bhaktapur, Nepal			
3	Autodesk Asia Private Limited, Singapore			
	NATIONAL			
4	Toc H Institute of Science and Technology, Arakkunnam, Kerala			
5	Commonwealth Science & Technology Academy for Research, Chennai			
6	EdCIL (India) Limited, Noida			
7	Sri Venkateswara College of Engineering and Technology, Chittoor, Andhra Pradesh			
8	Sathyabama University, Chennai			
9	Anna University of Technology, Madurai, Tamil Nadu			
10	Dr. Mahalingam College of Engineering & Technology, Pollachi, Tamil Nadu			
11	Vellore Institute of Technology, Vellore, Tamil Nadu			
12	Sri Aravindar Engineering College, Villupuram, Tamil Nadu			
13	Everonn Technical Education India Limited, Perungudi, Chennai			
14	Muthayammal Engineering College, Rasipuram, Tamil Nadu			
15	National Institute of Technology Puducherry, Karaikal			
16	Anna University, Chennai			
17	Jawaharlal Nehru Technological University, Anantapur, Andhra Pradesh			
18	Visvesvaraya Technological University, Belgaum, Karnataka			
19	Kakatiya University, Warangal, Telangana			
20	SRM University, Chennai			
21	DoTE, Puducherry			

Sl. No.	Name of the Institutions			
23	DoTE, Trivandrum, Kerala			
24	State Technical Education Board, Vijayawada, Andhra Pradesh			
25	SANDIP University, Nashik, Maharashtra			
26	PSR Engineering College, Sivakasi, Tamil Nadu			
28	Karunya Institute of Technology and Science, Coimbatore, Tamil Nadu			
29	AMET (Deemed to be University), Chennai			
30	Tiruvallur University, Vellore, Tamil Nadu			

c) International

NITTTR Chennai has a strong base with international community, in accordance to the recommendation made in the Jha Committee in the year 1978, NITTTR Chennai started offering international training courses in 1982. For the past 38 years, NITTTR Chennai trained more than 3000 personnel from 107 ITEC countries.

"INDIA WILL BE PROMOTED AS A GLOBAL STUDY

DESTINATION PROVIDING PREMIUM EDUCATION AT

AFFORDABLE COSTS THEREBY HELPING TO

RESTORE ITS ROLE AS A VISWA GURU"

National Education Policy - 2020

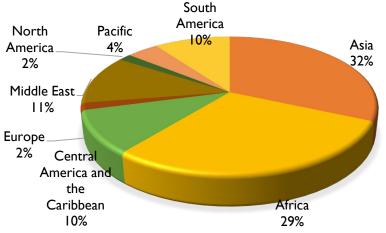


Figure 20: Participants representation from Countries

NITTTR Chennai is one of the institutes selected for e-ITEC programme during the pandemic period in 2020 by the Ministry of External Affairs, Government of India. The strong network which we established with our alumni and quality of programme which we offered, gave credit to offer around six e-ITEC programmes to different countries and trained more than 100 participants through online mode. We have planned to start specialized online programmes and customized training programme with international funding. In addition to the ITEC countries, we also offered training programme under the funding of UNESCO and World Bank. Specialized leadership programme was conducted for the Vice-Chancellors and Deans of Afghanistan Universities / Institutions in 2019 and it was a great successful programme and created a wide impact. We have international doctoral research students working in the area of engineering education and our faculty members act as a joint advisor for international students.

d) Government Agencies

At present NITTTR Chennai actively involved with the government agencies through research / consultancy projects, and training their staff both in-service and newly recruited personnel. In

the past one decade, around 1000 engineers from the government agencies viz., Tamil Nadu Pollution Control Board, Tamil Nadu Slum Clearance Board. Public Works Department, Tamil Nadu Housing Board, Tamil Nadu Highways Department, Central Ground Water Board. Safdarjung Hospital, Ramachandra Medical Hospital and various other organization. We government



collaborated with the government organizations both in providing training and conducting collaborative research and consultancy projects.

e) Industries and Organizations

To meet the challenges of globalization and rapidly expanding industrial scenarios, it is imperative for the students and faculty members to update themselves at regular intervals, else the industries will march ahead, and the curriculum will be obsolete and graduates would not match the requirements of the industries and may become unemployable. At present, we are discussing about industry 4.0 whereas the education is at 3.0. Hence, the pace at which education provided need to be meet and march ahead of industrial growth. Therefore, this is very important and the NITTTR Chennai will plan and collaborate with industries/organisations for conducting training.

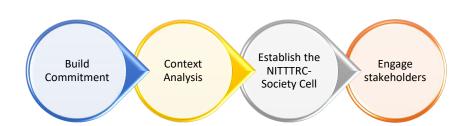




f) Professional Societies

NITTTR Chennai has a strong network with the professional societies such as INSPA, IEI, IGS,

IEEE, IUCEE and ISTE. To create the type of engagement to the technical teachers that will help them to shape the



profession and remain relevant in the future, linkage to the professional societies is essential. It has demonstrated an ability to evolve and successfully launch and expand offerings that were embraced by the society.

g) Strategies for the next five years (Roll out plan)

To have a strong network and enhance the visibility of the institute and serve towards national growth, the specific objectives and targets / are:

- To increase the number of MoU actively with industries and a minimum of four industry-oriented courses through MoU in each department/centres by 2025.
- To increase the number of courses offered by each department/centres to five courses purely by industries and offer at least two training programme to industries by each department/centres by 2025.
- To engage the faculty members actively with industries as a nodal coordinator and involve them in the industries-based collaborative research projects.
- To develop courses for industries to document classical procedure and translate them into contextual learning.
- To collaborate with professional societies both nationally and internationally and jointly organize, at least one seminar/conference by each department per year.
- To involve with the government agencies and collaborate with them in projects of societal transformation.
- To encourage at least 40% of the faculty to file patent/copyright along with the industries by the year 2025.
- To encourage partnership with industries by engaging experts from industry to the institute as "Professor of Practice".



9) INFRASTRUCTURE DEVELOPMENT PLAN

a) Introduction

NITTTR Chennai is a residential institute that occupies a 25.4 acre of academic campus that was established during 1964. The main entrance of NITTTR Chennai is located on Rajiv Gandhi IT Corridor, opposite to Thiruvanmiyur MRTS railway station, flanked by the residential zone namely Adyar, Thiruvanmiyur and Velachery. The campus is very close to the important IT parks of the City viz., Tidel Park, Ascendas, and Ramanujam IT Park. To meet the demands of the future requirements, the enhancement of the quality of existing infrastructure and constructing of new infrastructure is essential. In view of this the present infrastructure facility, ongoing renovation/construction activity and future plan to meet infrastructure demand are provided here.

Specific objectives and targets

 To upgrade the quality of all academic buildings and their surroundings to global standards.



- To create an excellent environment in the hostels by providing healthy food and comfortable accommodation to students.
- To expand the laboratories and classrooms to accommodate increased number of students and research scholars.
- To provide sufficient and well-maintained residential quarters with all basic amenities for the faculty and staff members.
- To create a sustainable clean, green and energy efficient campus.

The construction and quality enhancement of existing building activities had been commenced during 2011. For the past, eight to ten years a large amount of money was spent towards the establishment and enhancement of the infrastructure facilities at NITTTR Chennai as well as in extension centres. Our infrastructure details are provided in five clusters namely Learning Space, State-of-Art Laboratory, staff accommodation, Sports-cultural facilities and SWACHHATA campus. The induction of competent faculty members and increase in research activities are to be given top priority, as described in the foregoing. These changes call for a corresponding development of the research space, residential area and other infrastructure of NITTTR Chennai. In 2016-2017, a comprehensive master plan was drawn up to bring about these developments. The plan covers the buildings, roads, open spaces, electrical and networking (LAN) infrastructure, water distribution system, STP and other facilities.

The Master Plan added space zone-wise in the campus: the academic zone, the hostel zone,



and the International residential zone. Important emphasis laid on cleanliness, safety and energy resource conservation and reuse. This Master Plan also attempted to retain the unique character of the campus. It proposed the construction of multi-storey buildings especially the

construction of a four-storied International Hall of Residence, so that the increase in the footprint of built-up space will be minimal. New facilities planned in the hostel zone are nearly at completion stage. The first phase of expansion in the international residential zone is in progress and rebuilding of old laboratories of departments / centres are also at the final stage of completion.

The following are the major features of this plan: The intent is to provide an excellent living ambient of a total student population of 250.

I. LEARNING SPACE

The twenty four class-rooms in the campus with new furniture facility and few classrooms have retain their heritage look with vintage teakwood furniture. All class rooms are Air-conditioned to facilitate a blend of traditional and modern modes of teaching such as:

- Two panel Green Boards which reduce glare on eyes and help improve the capacity for learning.
- Overhead Wi-Fi enabled LCD projectors with Roll-down screens cascading. The LCD projectors can be used by Wi-Fi or VGA cables.

APJ ABDUL KALAM ACADEMIC COMPLEX

The APJ Abdul Kalam Academic complex is designed for G+4. During 2012, to meet the demand



of the institute, three storey (G+2) was constructed at the cost of 12 Crores. The total building area is 2700 m². This building has twelve class rooms, three smart class rooms, two seminar hall, one auditorium, one studio, 5 discussion halls and a spacious Cafeteria. All rooms are air-conditioned and equipped with all the

latest technology classroom facilities, like smart board, wi-fi, smart projector etc. where majority of common classes for Post-graduate students, and, National and International Participants are conducted. The view of this building from outside is very scenic. The vertical expansion of this building will serve additional demand, which will be required for the future development plan.

















Figure 21: Learning space furniture arrangement

L-Building

It is presently hosting the Department of Education, and the Department of Computer Science and Engineering. This building cover an area of 5809 m² and has one seminar hall, one Yoga hall, Environmental Engineering Laboratory, Education and Computer Science Laboratories.





Resource Centre

The NITTTR Resource Centre (Central Library) is a two storey air-conditioned and Wi-Fi enabled

unit with seating capacity for about

100 readers. This library has housed
the latest technologies in library
sciences to provide the best learning
environment to its
national/international participants,
students and researchers. The library
is presently having a collection of over



thirty thousand volumes on different subjects, latest publications in the fields of Civil Engineering, Infrastructure Engineering, Electronic and Communication Engineering, Computer Engineering, Engineering Education, Business, Economics, Humanities and Social Sciences are

continuously added to the collection to equip the students with the latest advancements Engg. & Technology.

The Resource Centre of NITTTR Chennai has more than 3500 e-books, 8,000 e- journals,



audiovisual facilities, reading rooms, etc. The institute Library is fully modernized and provides user friendly services to its users. The library is equipped with all the latest facilities and technology. The digital library, freely accessible to all the learners through the intranet, will, therefore,

improve the educational system. It will make retrieval of relevant information from books, manuscripts and journals much easier and far more reliable. Students will succeed far more in finding exactly what they seek and increased success will encourage them more to get more involved in research. More than one individual will be able to use the same book at the same time. Thus, material will not be physically checked out and thus become unavailable to others. The following role of the Central library has to move beyond the traditional role to one of being an active participant in the dissemination, multiplication and validation of knowledge.

- Play the role of a navigator of knowledge, a facilitator of retrieval and dissemination.
- Subscribe to world-wide networks and facilitate teachers and students to participate in innovative learning experiences that allow interactions across distance and time.
- Facilitate access for teachers and students to researchers, industry experts, and technologists worldwide.
- Become a key partner in the education and learning experiences of the society as a whole.

 Technological solutions for improving the library's operations will enable it to extend much wider access and encourage more effective utilization of its facilities and academic resources.

Auditorium

NITTTR Chennai has two Auditoriums namely Smt. Indira Gandhi Auditorium and Thiruvalluvar

Auditorium. A state of the art auditorium with seating capacity of 150 persons named as Thiruvalluvar Auditorium in first floor of the Dr. APJ. Abdul Kalam academic complex. This is fully air conditioned with latest acoustic features, modern audio-visual system and comfortable seating arrangements.



Another indoor auditorium called Indira Gandhi Auditorium with seating capacity of 175 persons. This is being renovated to cater the future needs. The above two auditoriums will be useful for technical presentation, conferences / seminars / workshops and other institutions.

ETV studio

A state of the art education television studio is available in the campus with modern equipments to cater the needs of visual recording. Earlier gyandharshan programmes were conducted in the studio. At present educational video development is undertaken and programmes are conducted for National and International participants. The Centre is equipped with latest software and hardware facilities for video production and e-content development. ETV Studio of this centre is acoustically well designed with the state-of-art facilities for recording audio/video, editing and previewing. Video Cassettes library with nearly 300 master cassettes/ DVD's arranged systematically for quick retrieval is located inside the ETV Studio. CCTV/Micro-Teaching

Laboratory attached with this centre is equipped with modern facilities for video recording, editing and play back for assessing the teaching skills of participants attending training programs on Pedagogy.





II. ACCOMMODATION

Hostels and Other Facilities

The NITTTR Chennai has altogether two spacious and well-furnished separate hostels for both

boys and girls within the academic campus. State of the art facilities for the comfortable stay of students are provided in these two hostel buildings (TGH -I and TGH-II) which spread over 2461 m² and 1833 m² area respectively. Both are three storey building (G+2). The hostels are recently renovated to latest standards of living for students in a pollution free environment, ensuring the



utmost comfort for the students. The Hostel Buildings, equipped with Wi-Fi and computer system, recreation hall, reading room, and other indoor sports facility. The A/C and Non-A/C rooms are available. The hostel building also houses a modern kitchen, mess ensuring hygienically cooked healthy diet, well-equipped Gym, Health Centre and laundry facility, besides a badminton court in the courtyards. A clean and crisp laundry facility is available for

all the students and international participants, who are residing at Hostel/International Guest House. This help many students, to concentrate on their curriculum.

Well-designed spacious and spotlessly maintained dining halls is available to cater to different needs of students. Good hygienic condition and nutritional food is served for development of brain, soul and body. We have special, continental, vegetarian food served in different messes. Special menus are provided during festive occasions. Separate institute canteen is also available to cater to the needs of the student's individual needs.

International Guest houses:

This institute has AP Jambulingam guest house of 493.23 m² area for visiting faculty and



dignitaries, and an international guest house of 2477.93 m² with universal standards to accommodate participants from foreign countries with dining facility. This guest house has 43 well-equipped rooms, and three suite rooms, spread across three floors (G+2). Television, refrigeration, telephone, desk, wardrobe and attached bathroom with hot

water facility are some of the conveniences offered in the room. This International Guest House provides various facilities that include 24-hour front desk, elevator, luggage storage, power backup generator, and security guard.

Cafeteria

From quick bites between classes to full meals, the cafeteria serves a wide array of good and hygienic food to all the staff and student community. It is spread in a 200 m² area to accommodate our large and growing student and staff population. It is a perfect spot for serving tea / coffee and



snacks during morning and afternoon tea break during conference / seminar / workshop and national / international training programmes.

ATM

NITTTR Chennai has a dedicated ATM facility within the campus provided by the Indian Overseas Bank. The ATM is located in conveniently accessible place in the campus. This campus ATM facility is made available both for public and NITTTR members comprising of faculty, students, and staff.



POST OFFICE

The India Post has established the Taramani post office (Chennai 600 113) in the south west



corner of the campus. It provides all normal services and facilities which are available everywhere in the country. For Students, the Post Office is offering following useful services specially: Saving Bank (with Cheque Book and ATM card facility), Recurring

Deposit Accounts, Post crossing (special cards), and e-Post.

Health Care Facility

The health care of all the students, national/international participants, staff members, contract and project staff of NITTTR Chennai is ensured by a regular senior doctor who is available on the campus on alternate days (Mon, Wed, Fri) of the week.



NITTTR Staff Quarters

NITTTR Chennai has a residential campus exclusively for its staff members. It is situated at



Gandhi Mandapam Road, Kotturpuram, 5Km away from the Academic campus. The quarters were constructed in a 5 Acres of land which is taken on Lease from the Government of Tamilnadu. This residential campus has wide entrance and exit gates. With neatly laid internal roads and backyards with green environment.

The following buildings are available in the campus

Sl. No.	Particulars	Numbers	Plinth Area
			(Sq.m)
Α	Director Bungalow	01	176.9
В	Faculty Quarters (T -Type)	20	139.8
С	Staff Quarters (C-Type)	12	61.5
D	Staff Quarters (B-Type)	18	43.6
E	Staff/Research scholar Qts (A-Type)	06	26.8
F	Overhead water reservoir/Pump house	01	120.0
G	Community Hall	01	250.0





The A - type residential block is especially dedicated to the full time married research scholars.

Campus Security

The safety and security of the students within the campus is being taken care by an external private security agency on contract basis. The security personnel are kept vigilant especially for the students, staff, faculty and visitors, and also protect the institute property against theft and vandalism. NITTTR Chennai is equipped with CCTV cameras at the important locations such as Entrance Gate, Administrative Building, International Guest house, Boy's and Girl's Hostels and Library as a precautionary measure to monitor visitors.

IV SPORTS FACILITIES

While games, sports and athletics directly contribute to physical development of students,

other co-curricular activities also indirectly, contribute to it. Rejuvenation is required for everybody especially for students. Mind and soul will be intact, only when health is maintained. Sports play a pivotal role in shaping one's personality and maintaining good health.



keep our students engaged and physically fit. We have specially developed a sports environment that matches international standards and gives a truly global experience to all our students. All of which is provided to them on the campus.

To keep the students in a healthy manner state of the art sports facilities are provided in this campus. An Indoor Stadium spread over 341.34 m² area. The courts laid with wooden planks are used for Badminton and Table Tennis. In addition, NITTTR Chennai has facilities/grounds for Football, Volleyball, Table-Tennis, Badminton etc.

Volleyball and Badminton Court

Campus is having various sports and recreational facilities for the use of Students in the Campus which enable them to prepare for various levels of competitions / tournaments. Two badminton court and one volleyball court with all facilities like fencing and flood lighting are available at our NITTTR Chennai premises.

TABLE TENNIS

Being one of the most popular sports in our campus, table tennis is played by a large number of students in the evenings. We have created table tennis facilities to help the budding players in every way they can.





Yoga Centre

NITTTR Chennai offer training on all aspects of Yoga and meditation to the residential students, national and international participants. It provides a calm environment conducive to practice Yoga. This centre offers the opportunity to learn and practise Yoga and meditation, which

improves mental strength, manage stress, and create more energy and supportive community. The main moto is to enable the students to have Good Health, to practice mental hygiene, to possess Emotional stability, to integrate Moral values and to attain higher level of consciousness.



FITNESS CENTRE/GYMNASIUM

In order to ensure a sound body and mind, students are given special attention on health and



fitness. The NITTTR Chennai maintains its own fitness centre/gymnasium, located in the AP Jambulingam guest house. A modern gym, with all the latest gadgets like Training Bench, Recumbent Bike, Motorized Treadmill, Spin Bike, 2 stack 4 station Multi Gym, Adjustable AB Board, Precher Curl Bench, Double Side Twister, Dumbbells, Z-Curl Bar, Striate Bar, Push Up Bar etc. had been set up in

the campus. With the help of these facilities, the students can do free weight, bodyweight, gym ball, resistance band, resistance machine, stretching etc. In future, it is also planned to develop open gymnasium to meet demands of the future population.

V. SWACHH CAMPUS:

Maintaining cleanliness and hygiene in any academic campus is very essential. Clean and Smart



Campus is reminds sustainable Development Goals of the United Nations. Green and lustre atmosphere in the institute is being maintained as pollution free and eco-friendly campus. A sewage treatment plant (STP) of 80 MLD is being constructed to treat the waste water and reuse it for maintenance of lawns, trees,

other greeneries in the campus. The Swachh Campus Initiative, envisaged by the Department of Higher Education, Ministry of Education, Government of India mirrors the principles of green

institutions and endeavours to extend learning beyond the classroom to inculcate responsible attitude, habits and lasting commitment to Swachhta, in our campus. Thus, the institute extends its hand in preserving Socio- Economic, Equitable, Viable Environment technology for *Swacch* campus development and building *Swachh Bharat* mission.

Rainwater Harvesting Pond

Rainwater harvesting pond has been constructed behind the L-building at south-east corner of the campus. This pond size is $25m \times 8m$ and 4m deep, which is surrounded by a fence. This

pond has four sections: two are filtering chambers and other two storage sections are for recharge to groundwater. This pond can store eight lakh liters of water, which is used for the gardening purpose. This was funded by the CGWB Chennai.



The land surface behind the L - building have been sloped toward the rainwater collecting pond in order to collect all the rain water that drains from the surrounding areas. Safety fencing and paver block pathway were provided around the pond.

Rainwater Harvesting from Roof top

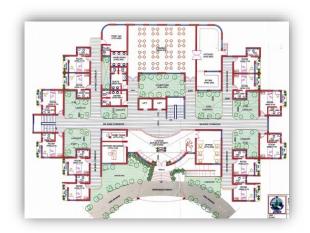
Rooftop rainwater harvesting is one of the optimistic and economically viable methods of rainwater harvesting. Rooftop rainwater is allowed to pond on land surface for prolonged period increase groundwater recharge. Rainwater collected from the roof top of administration block is stored in the nearby underground chamber near the Mechanical Engineering block after filtering it. This water is also used for the gardening purpose.

ONGOING PROJECTS IN NITTTR

International Hall of Residence

NITTTR Chennai is conducting international programmes and receives participants from 110

ITEC countries, sponsored by the Ministry of External Affairs, GoI. At present, yearly 12 four to eight weeks international training programmes are offered by the NITTTR Chennai. To accommodate participants from ITEC foreign countries, a five storied studio apartment namely International Hall of



Residence is under construction in the campus. This is a five storied (G+4) building, which is aprefabricated modern technology construction. 60 rooms and two suites with attached kitchen and restrooms are provided with modern facilities keeping the international standards. All the rooms and common area will be provided with free Wi-fi and designated 250KVA power backup. At present G+1 building is taken up at a cost of Rs.9.70 crores with future expansion of additional three more floors.

Renovation of Indoor stadium

To keep the fitness of the students in mind. The present indoor stadium is being renovated at par with international standards at a cost of Rs.45.30 lakhs. Sound proof anti- skid wooden flooring, acrylic wall finish and other amenities are being provided.

Renovation of laboratories

The Civil, Mechanical, Electrical laboratories and modern workshop are being renovated to highest standard with granite flooring, aluminium partitions and acrylic wall finishing at a cost

of Rs. 86 lakhs all latest equipments tools and instruments are being provided to cater the needs of research and technology.





Renovation of Admin block and Centre for Rural Development building

The present admin block and CRD building are being renovated with granite flooring in corridors and steps, vitrified tile flooring in rooms and acrylic wall finish to give an elegant dust free and aesthetic look at a cost of Rs. 1.64 crores.

FUTURE INFRASTRUCTURE DEVELOPMENT

Open air theatre

This institute proposed to have a state of the art. Open Air Theatre (OAT) with seating capacity of 400 persons. This OAT will have an elegant entrance foyer, seating gallery, an oval shaped open stage and refreshing facilities.



Football ground & basketball ground

NITTTR proposed to have a football and basketball ground with International standards to cater the needs of students in a green environment at a cost of Rs. 1 Crore

Sewage Treatment Plant (STP)

Green and lustre atmosphere in the institute is being maintained as pollution free and ecofriendly with green concepts. Waste water management plays an important role in keeping the campus eco -friendly and green environment. To maintain the ecosystem by reusage of waste, a sewage treatment plant (STP) of 50 KLD is proposed to be constructed to treat the waste water and reuse for the maintenance of lawns, trees, other greeneries in this campus at a cost of Rs.85.39 lakhs. Thereby NITTTR fulfils the socio economic responsibility.

Central Research Facilities

Laboratory park

It is proposed to have a laboratory park. This laboratory park with the latest equipment and tools to feed the research students from various curriculum to conduct the experiments live. This laboratory park would be provide with all modern tools, instruments and equipments of international standards.

Research park

Even though students gain knowledge while pursuing their studies in laboratories, there is a need for enhancing their exposure in research skills. To cater their thirst, a Research park with all latest amenities and explore the potential of individual students to have excellent exposure to the world.

New Entrance gate

The present entrance gate situated in CSIR road which is away from the main OMR road to be in the vicinity of public and easy accessibility. It is proposed to have an elegant state of the art in the main OMR road this will have



accommodation and waiting area for security personal and visitors.

Jogging track

NITTTR pays attention to be physical fitness of the student, fraternity to keep their mind, body and soul in a balance condition. To augument this need 600 m long and 1.50m wide jogging track is being constructed at an estimated cost all around the compound wall of this campus with well laid temple stone pavement footpath in a lustre green surrounding.



Open Gymnasium

Doing exercise is good for physical & mental health that helps students to live a healthy and

happy life. Doing exercise on a regular basis results in increased energy levels and happiness followed by a better academic performance and a healthy lifestyle also reduces the risk on stress levels and any diseases, that increases strength, flexibility and improves self-confidence. For the use of the inmates of hostel/international guest house, it is proposed to



construct an open gym with all necessary equipment at the cost of Rs.60 laks.

Table: Area of existing infrastructure

Admin block 01 5324.74 Chairman room 01 52.41 Director room 01 51.83 Director office 01 53.60 Admin office 01 187.78 + Genter for Education Management and Applied 01 61.85 Center for Education Management and Applied 01 159.33 Psychology SWAYAM office 01 55.18 Center for educational media & technology 01 193.57 Micro teaching lab 01 30.67 EMC store 01 24.11 G.J.S lab 01 59.89 Geo technical lab 01 132.30 Center for Curriculum Development Planning & 01 192.06 Cordination. Advanced Manufacturing lab 01 360.9 Mechanical Lab / Department 01 360.9 Mechanical Lab / Department 01 360.9 Power Electronics Instrumentation Lab 01 59.73 Electronics Lab. 01 68.55 Electronics Lab. <th>Name of Building</th> <th>Number</th> <th>Plinth Area (m²).</th>	Name of Building	Number	Plinth Area (m²).
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Director office	Chairman room	01	52.41
Admin office	Director room	01	51.83
Record room	Director office	01	53.60
Record room	Admin office	01	187.78 +
Center for Education Management and Applied Psychology SWAYAM office O1 55.18			39.11
Psychology	Record room	01	61.85
SWAYAM office 01 55.18 Center for educational media & technology 01 193.57 Micro teaching lab 01 30.67 EMC store 01 24.11 G.I.S lab 01 59.89 Geo technical lab 01 132.30 Center for Curriculum Development Planning & Coordination. 01 360.9 Advanced Manufacturing lab 01 360.9 Civil Department 01 360.9 Mechanical Lab / Department 01 360.9 Power Electronics Instrumentation Lab 01 59.73 Electronics Lab. 01 68.55 Electronics Lab. 01 68.55 Electronics Lab. 01 212.344 Board room 01 64.84 ETV studio 01 187.47 Alc plant room 01 36.42 L building 01 147.80 Foyaga room 01 147.80 Environmental Lab 01 156.99 Seminar Hall	Center for Education Management and Applied	01	159.33
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Power Electronics Instrumentation Lab	Civil Department	01	360.9
CAD / CAM Lab. 01 59.73 Electronics Lab. 01 68.55 Electronics Lab. 01 212.344 Board room 01 64.84 ETV studio 01 187.47 A\c plant room 01 36.42 L building 01 5809.66 Yoga room 01 147.80 Environmental Lab 01 157.58 G24 class room 01 156.99 Seminar Hall 01 335.82 Environmental Lab 01 156.99 Computer Lab 01 156.99 Communication Lab 01 158.41 Education Lab 01 158.41 Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH - 2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 <td>Mechanical Lab / Department</td> <td>01</td> <td>360.9</td>	Mechanical Lab / Department	01	360.9
Electronics Lab. 01 68.55 Electronics Lab. 01 212.344 Board room 01 64.84 ETV studio 01 187.47 A\c plant room 01 36.42 L building 01 5809.66 Yoga room 01 147.80 Environmental Lab 01 157.58 G24 class room 01 156.99 Seminar Hall 01 335.82 Computer Lab 01 335.82 Environmental Lab 01 156.99 Communication Lab 01 158.41 Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH - 2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House	Power Electronics Instrumentation Lab	01	360.9
Electronics Lab.	CAD / CAM Lab.	01	59.73
Board room 01 64.84 ETV studio 01 187.47 A\c plant room 01 36.42 L building 01 5809.66 Yoga room 01 147.80 Environmental Lab 01 157.58 G24 class room 01 156.99 Seminar Hall 01 335.82 Computer Lab 01 335.82 Environmental Lab 01 156.99 Communication Lab 01 158.41 Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH - 2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 <	Electronics Lab.	01	68.55
ETV studio 01 187.47 A\c plant room 01 36.42 L building 01 5809.66 Yoga room 01 147.80 Environmental Lab 01 157.58 G24 class room 01 156.99 Seminar Hall 01 335.82 Computer Lab 01 156.99 Communication Lab 01 158.41 Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH - 2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	Electronics Lab.	01	212.344
A\c plant room 01 36.42 L building 01 5809.66 Yoga room 01 147.80 Environmental Lab 01 157.58 G24 class room 01 156.99 Seminar Hall 01 335.82 Computer Lab 01 335.82 Environmental Lab 01 156.99 Communication Lab 01 158.41 Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH - 2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	Board room	01	64.84
L building 01 5809.66 Yoga room 01 147.80 Environmental Lab 01 157.58 G24 class room 01 156.99 Seminar Hall 01 335.82 Computer Lab 01 335.82 Environmental Lab 01 156.99 Communication Lab 01 158.41 Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH - 2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	ETV studio	01	187.47
Yoga room 01 147.80 Environmental Lab 01 157.58 G24 class room 01 156.99 Seminar Hall 01 335.82 Computer Lab 01 335.82 Environmental Lab 01 156.99 Communication Lab 01 158.41 Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH -2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	A\c plant room	01	36.42
Environmental Lab 01 157.58 G24 class room 01 156.99 Seminar Hall 01 335.82 Computer Lab 01 335.82 Environmental Lab 01 156.99 Communication Lab 01 158.41 Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH -2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	L building	01	5809.66
G24 class room 01 156.99 Seminar Hall 01 335.82 Computer Lab 01 335.82 Environmental Lab 01 156.99 Communication Lab 01 158.41 Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH -2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	Yoga room	01	147.80
Seminar Hall 01 335.82 Computer Lab 01 335.82 Environmental Lab 01 156.99 Communication Lab 01 158.41 Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH - 2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	Environmental Lab	01	157.58
Computer Lab 01 335.82 Environmental Lab 01 156.99 Communication Lab 01 158.41 Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH - 2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	G24 class room	01	156.99
Environmental Lab 01 156.99 Communication Lab 01 158.41 Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH -2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	Seminar Hall	01	335.82
Communication Lab 01 158.41 Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH -2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	Computer Lab	01	335.82
Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH -2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	Environmental Lab	01	156.99
Education Lab 01 145.36 Indira Gandhi auditorium 01 493.82 Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH - 2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	Communication Lab	01	158.41
Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH - 2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	Education Lab	01	145.36
Resource Center 01 1187.27 TGH - 1 01 2461.80 TGH - 2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93	Indira Gandhi auditorium	01	493.82
TGH -2 02 1833.48 CRD building 01 1447.38 Ground floor 01 709.51 First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93		01	
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First floor (CSAR) Right wing 01 239.51 First floor (multimedia) Left wing 01 259.56 Dr. Jambulingam Guest House 01 330.48 Guest House 02 162.75 International guest house 03 2477.93			
First floor (multimedia) Left wing01259.56Dr. Jambulingam Guest House01330.48Guest House02162.75International guest house032477.93			
Dr. Jambulingam Guest House01330.48Guest House02162.75International guest house032477.93			
Guest House02162.75International guest house032477.93			
International guest house 03 2477.93			
Director at Crianic Crima tub	Structural engineering lab	01	69.22

Name of Building	Number	Plinth Area (m²).
Garage	01	180.21
Power supply room	01	113.25
Generator room	01	51.72
Indoor statium	01	341.34
Estate office	01	211.52
Pump house	01	29.63
Pump house	02	23.52
Abdul Kalam building	01	3721.32
class room G1	01	64.315
Class room G2	02	66.215
Class room G3	03	66.215
Class room G4	04	66.215
class room G5	05	64.315
Video conferencing hall	01	92.53
Dining Hall &modular kitchen	01	216
Discussion room	01	72.45
A/C control room	01	24.15
Office waiting hall	01	17.22
New studio	01	92.53
Class room F1	01	92.53
Class room F2	06	66.215
Class room F3	07	66.215
Class room F4	08	66.215
Class room F5	02	72.45
Thiruvalluvar auditorium	01	216
A/C control room	02	24.15
Office waiting hall	02	17.22
Smart class	02	92.53
class room S1	09	64.315
Class room S2	10	66.215
Class room S3	11	66.215
Class room S4	12	66.215
Class room S5	03	72.45
A/C control room(Abdul Kalam)	03	24.15
Office waiting hall	03	17.22
Smart class	03	92.53

10) FINANCE PLAN

a) Introduction

An overview of NITTTR Chennai budget in recent years (specifically, 2016-2020) is provided in this section. The Institute receives funding from Ministry plan grant, revenue from training programme and consultancy projects. The scope of the revenue generation is limited due to mode of operation. However, the future growth is reflected in all the avenues of funding to be generated from student fees, trainee enrolment fee, special MOOC courses and other initiatives.

The financial requirements for implementing the five-year rolling plan estimates are summed up in the Table.

Table: Expansion Plan Five Year Financial Requirement (Rs. in lakhs)

Item	Year 1	Year II	Year III	Year IV	Year V
Infrastructural Development	100	125	150	200	250
Salaries	150	200	200	250	250
O & M Expenditures	75	75	75	75	75
Consumables	50	50	50	50	50
Total	375	450	475	575	625

11) GOVERNANCE PLAN

a) Introduction

As indicated in earlier, NITTTR Chennai, is to be one of the members of the NITTTR group of institutions. It is to be promoted and fully financed by the Ministry of Education, Government of India, with the objective of imparting high-quality education in the realm of core engineering, engineering education and related areas. According to UGC DU regulations Clause 10.12.9,

"Notwithstanding anything contained in these regulations, the governance system and management structure of an Institution Deemed to be University managed and controlled by the Central Government or State Government shall be in accordance with the decision of the appropriate Government".

Therefore, Institute will abide by the directives of the Ministry of Education, Govt. of India.

b) Proposed structure of Governance

NITTTR Chennai wish to adopt inter-linked system of governance with executive and operation management. The existing NITTTR Council will create the task force on behalf of clientele system and stakeholder to monitor and create excellence in the operation.



The four-tier structure represented ensures that:

- Strategic Supervision being independent of strategic & policy management can be conducted with the objectivity to protect and enhance stakeholder value and to ensure accountability;
- Strategic and Policy Management being independent of executive management remains focused towards providing the principle-centered leadership to enable the Institute to meet the challenges of tomorrow and to set policies and strategies to drive it forward towards a position of leadership in the realm of national security;
- Executive Management being free from responsibilities for day-to-day operations can focus on coordination and synergistic control and execution of present plans; and
- Operations Management of both line and support functions being free from executive management of the Institute as a whole can focus on enhancing the quality, efficiency and effectiveness of individual line / support functions.

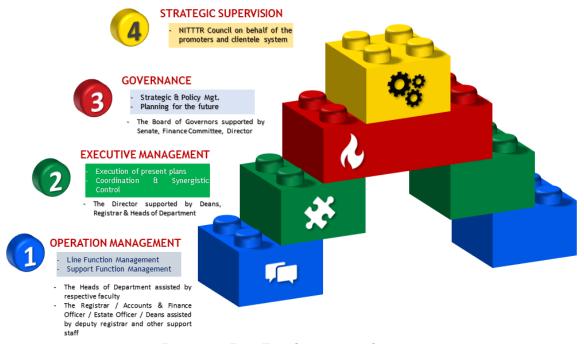
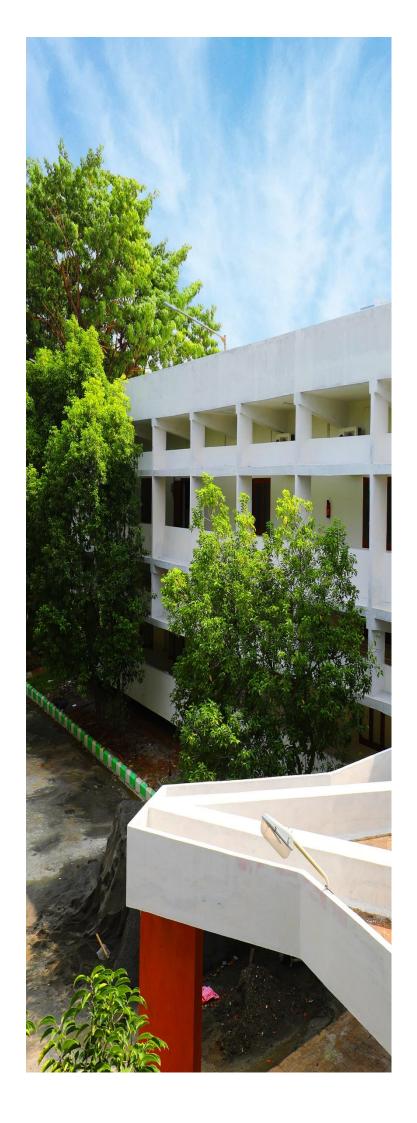
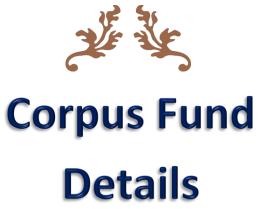


Figure 22: Four Tier Governance Structure









राष्ट्रीय तकनीकी शिक्षक प्रशिक्षण एवं अनुसंधान संस्थान NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH भारत सरकार, शिक्षा मंत्रालय [उच्चतर शिक्षा विभाग]

Government of India, Ministry of Education, [Department of Higher Education] तरमणि, चेन्नई - ६०० १९३, Taramani, Chennai - 600 113.

प्रो. डॉ. सुधींद्र नाथ पंडा Prof. Dr. SUDHINDRA NATH PANDA

Director

ANNEXURE-

TO WHOM IT MAY CONCERN

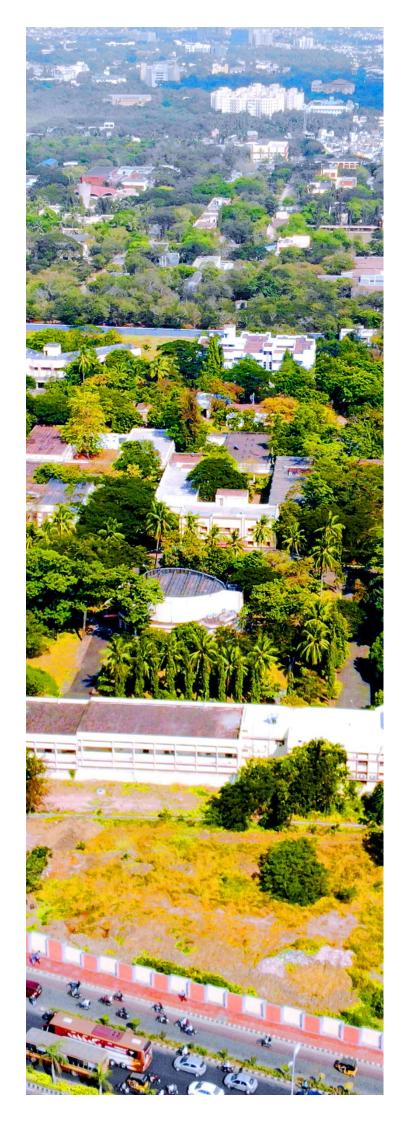
This is to undertake that the corpus fund irrevocable in nature and shall not be liquidated without prior permission of the commission and interest accrued on the corpus fund shall be used only for the purpose of development of the Institution deemed to be university.

Phone : +91-44-2254 2334 / 2254 5405

: +91-44-2254 1126 Website: www.nitttrc.ac.in

Director's Office: +91-44-2254 1982 / 2254 5406

: dir@nitttrc.ac.in / snpanda@nitttrc.ac.in









Director

राष्ट्रीय तकनीकी शिक्षक प्रशिक्षण एवं अनुसंधान संस्थान NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH भारत सरकार, शिक्षा मंत्रालय[उच्चतर शिक्षा विभाग]

Government of India, Ministry of Education, [Department of Higher Education] तरमणि, चेन्नई - ६०० १९३, Taramani, Chennai - 600 113.

प्रो. डॉ. सुधींद्र नाथ पंडा Prof. Dr. SUDHINDRA NATH PANDA निदेशक

ANNEXURE-

TO WHOM IT MAY CONCERN

This is to undertake that the Institution is non-profit organization shall not be engaged in communalisation of higher education.

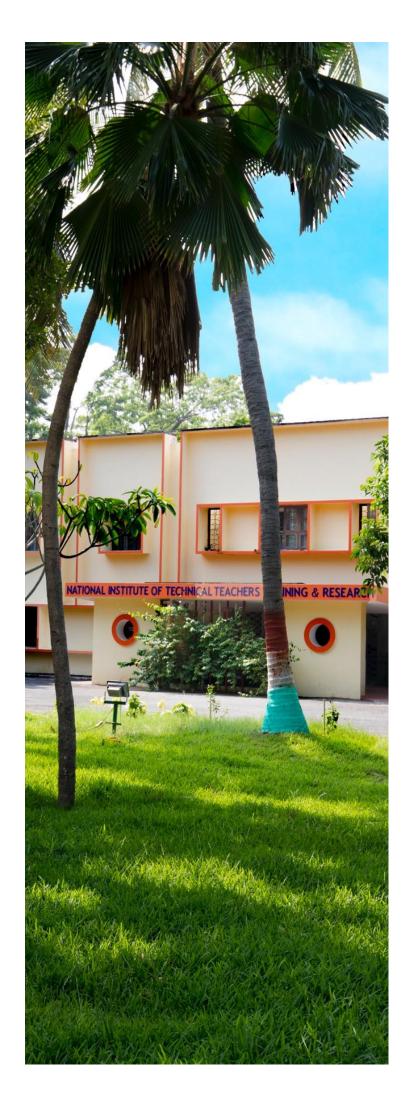
(Sudhindra Nath Panda)

Director

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E-mail : dir@nitttrc.ac.in / snpanda@nitttrc.ac.in





No Objection Certificate





F. No. 7-3/2019 -TS-IV

Government of India/ भारत सरकार

Ministry of Education / शिक्षा मंत्रालय

(Department of Higher Education)/ उच्चतर शिक्षा विभाग

Shastri Bhawan, New Delhi-110115 Dated November, 2020

To

Director, NITTTR Chennai

Subject: - Submission of Proposal for Deemed -to -be University Status of NITTTR, Chennai- reg.

Sir,

I am directed to refer to your letter no. Admin./DU/Com. L r./MoE/2020-21/253 dated 12.11.2020 on the above mentioned subject and to say that this Ministry will continue financial support to National Institute of Technical Teachers Training & Research, Chennai even after its declaration as deemed to be University.

Yours faithfully,

(M'M Singh) Director (TS.IV)







PROFILE OF FACULTY / STAFF MEMBERS OF DEPARTMENTS / CENTRES OF NITTTR, CHENNAI

Prof. Dr. SUDHINDRA NATH PANDA

Director

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Areas of expertise:

Water Conservation and Reuse, Systems Approach for Integrated Land &

Water Resources Planning & Management.



DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

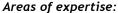
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Areas of expertise:

Geoenvironmental Engineering, Sustainable Development, Environmental Impact Assessment, Urban Environmental Management, Project Management for Infrastructure, Green Building Technologies, Water Quality Management, Blended and Flipped Approach,

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Areas of expertise:

Groundwater Modelling, Structural Design, Geographical Information System, Engineering Education - Instructional Objectives, Learned Centered Teaching Methods, Instructional

Planning, Evaluation, Outcome Based Education



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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Areas of expertise:

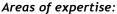
Engineering Pedagogy and Psychology, Training Technology, KBCS, Instruction Design and Delivery System (IDDS), Educational Psychology, Soft Skills, Gender Studies, Guidance and Counselling, Transactional Analysis, Emotional Intelligence, Neuro-Linguistic Programming (Certified NLP Trainer), Yoga, and Healing techniques

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DEPARTMENT OF ELECTRICAL, ELECTRONICS & COMMUNICATION ENGINEERING

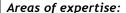
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Medical Electronics and Telemedicine, Computer Networking and Internet Technologies, Data Communication Systems, Advanced Communication System, Digital and Mobile Communications Systems, Satellite, Microwave and Fiber Optic Communication Systems, Computer Hardware and Personal Computer Maintenance, Virtual Instrumentation using MATLAB and

LabVIEW, Information and Communication Technology for Teaching and Learning System, Instructional Design and Delivery System, Instructional Materials and Media

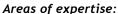
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Areas of expertise:

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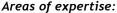
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and Accreditation



CENTRE FOR CURRICULUM DEVELOPMENT PLANNING AND COORDINATION

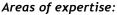
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Flipped Approach, AR, VR and Educational Technologies, Free Open Source Software for Academics, Outcome Based Education and Accreditation.

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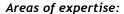
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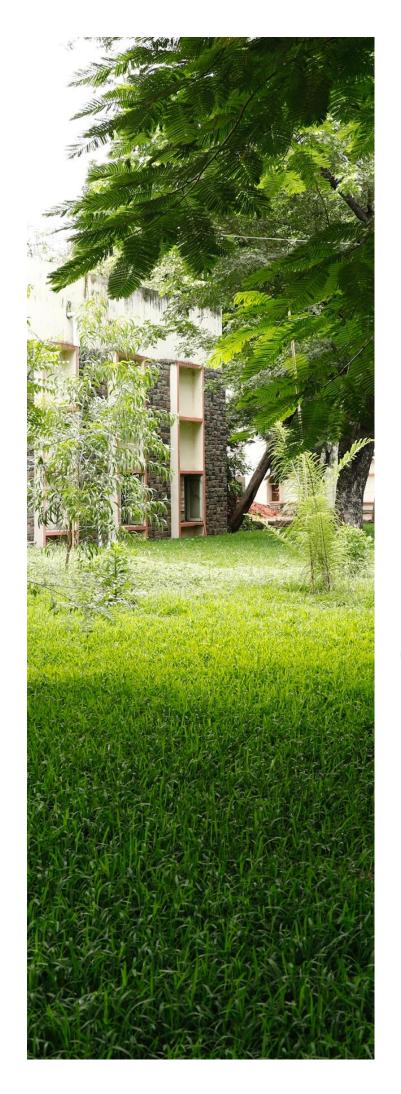
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Justification of Emerging Area



Post Graduate and Research Programmes

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Post-Graduate and Research Programmes

Post-Graduate(PG) Programme

National Institute of Technical Teachers Training and Research (NITTTR) Chennai envisage the National Educational Policy 2020 (NEP 2020) to enhance the Gross Enrollment Ratio to 50% by the year 2035. It is necessary to provide accessibility to higher educational institutes which is one of the reasons for low college/university level enrolment in the country. To make this plan a reality, NITTTR Chennai wish to offer Post Graduate Programmes with the following Objectives

- To develop the scientific, managerial and engineering manpower of the highest quality to cater to the needs of the Industry, R&D organisations and academia
- To cultivate high standard of performance in teaching & research
- To provide opportunity to students to do research in cutting edge areas
- To be a role model and leader of educational Institutions in the country
- To provide a broad grasp of the fundamental principles of the sciences, managerial and technological methods through its curriculum
- To provide a deep understanding of the areas of specialization
- To provide an innovative ability to solve new and open problems
- To provide a capacity to learn continually and interact with multidisciplinary groups
- To develop the students with a capability for:
 - Free and objective enquiry
 - Courage and integrity
 - Awareness and sensitivity to the needs and aspirations of society.
 - Doing independent research in their chosen areas

In this view, the post-graduate programmes are designed to include courses of study, seminars, project, internship and thesis submission through which a student may develop the concepts and intellectual skills.

Existing PG Programmes

NITTTR Chennai has been offering following three Post Graduate Programme which are affiliated to Anna University, Chennai

Sl.no	Programme	Specialization	Year of Commencement	Offering Department / Centre
1	ME	Infrastructure and Management	2019-20	Dept. of Civil and Environmental Engineering
2	ME	Electronics and Communication and Engineering (Industry)	2020-21	Dept. of Electrical, Electronics and Communication Engineering
3	ME	E-Learning Technologies	2020-21	Centre for Educational Media and Technology

Proposed PG Programmes

NITTTR Chennai wish to offer the following Post-Graduate programmes in addition to the existing PG programme based on the strength and facilities of the departments

Sl.no	Programme	Specialization	Offering Department / Centre		
1	M.Tech	Learning, Design, and	Centre for Educational Media and		
'	M. Tech	Technology	Technology		
2	M.Tech	Autotronics	Dept. of Mechanical Engineering		
3	M.Tech	Cognitive Computing	Dept. of Computer Science and		
3	M. Tech	Cognitive Computing	Engineering		
		Education for			
4	M.E	Sustainable	Dept. of Civil and Environmental		
7		Development	Engineering		
	Smart Infrastructui		Dept. of Civil and Environmental		
5	M.Tech	Engineering and	Engineering		
		Management	Linginicaling		

Sl.no	Programme	Specialization	Offering Department / Centre
6	M.Tech	Society 5.0	Dept. of Electrical, Electronics and
0	M. Tech	Society 5.0	Communication Engineering
7	MBA	International	Centre for International Affairs
/		Education Policy	Centre for international Arrairs
8	МВА	Educational	Dept. of Engineering Education
8		Transformation	Dept. of Engineering Education

1. M.Tech (Learning, Design and Technology)

Education takes a different shape when leveraging technology. Knowledge about how people learn, especially through collaboration and teamwork, is an essential factor in today's working life. Also, flexible and versatile use of information and communication technology is one key competence in today's education.

Learning Design is the framework that supports learning experiences. It refers to deliberate choices about what, when, where and how to teach. Decisions need to be made about the content, structure, timing, pedagogical strategies, sequence of learning activities, and the type and frequency of assessment in the course, as well as the nature of technology used to support learning. In fact, the concept has been evolving since the early 2000's, deeply rooted in Design Thinking. It's an intentional process that asks educators to think beyond "What do I need to teach?" and to carefully consider "What is the best way for my learners to learn and understand the concept?".

NITTTR Chennai has a legacy of conducting training programmes in the area of "Instructional Design and Delivery" for more than three decades. Moreover, for past one decade, NITTTR Chennai has been pioneer in imparting knowledge and skills required to integrate technology in teaching learning process to teachers of higher education institutes through Webcasting, Online Courses, Blended and flipped mode, and Online training programs. Owing to its success, it is proposed to offer Master's Programme in Learning, Design, and Technology.

The master's program in Learning, Design, and Technology aims to develop knowledge and competencies needed in modern education, namely skills for designing, conducting, assessing, and analyzing versatile learning situations both in face-to-face and technology-enhanced learning contexts. The program equips the students with a combination of strong theoretical knowledge of learning and collaboration, and diverse use of technology and social media that promotes learning. It can enhance in-person learning and bring classrooms to life virtually that

can be applied in adult learning, workforce training or other instructional design environments. They will also know how to develop multimedia content, extending the classroom to online and mobile learning environments, and assess the effectiveness of technology to support student learning.

2. M. Tech (Autotronics)

The Autotronics is referred to as modern automotive technology in the field of automobile engineering. Autotronics as an aspect of automobile engineering presents basics, advantages, layout and components and functional operation of various computer controlled motor vehicle systems. In addition, it clarifies how to use recent diagnostic tools and equipment for fault finding and analysis. It deals with computer controlled motor vehicle systems like; engine management, ABS (Antilock Braking System), TCS (Traction Control), SCS (Stability Control), self diagnosis and fault codes. Some of the modern cars are as much electronic as they are mechanical, thus creating a new AUTOTRONIC area (AUTOmobile + elecTRONIC). A modern car has several control modules, which monitor and manage most of the major systems in the vehicle. The most common types are engine and drive line control, cruise control, suspension control, anti-lock braking and airbag control, climate control, GPS-based navigation system, stability management system, instrumentation, infotainment, systems such as steering systems, collision warning, voice recognition, Internet access, night vision enhancement and collision avoidance systems.

Need for Autotronics education in India

As is the case in all areas of industry, lifelong learning is essential for the workforce, in order to stay viable in markets over the long-term. Ongoing automotive sector re-skilling is being pushed ahead in particular due to the following developments:

- The introduction of electronic and communications components from different manufacturers, based on different standards.
- Increasing technical complexity at the workplace in car garages (introduction of new machines, diagnostic technologies).
- The existence of unskilled mechanics in most of our car garages and as a consequence of this, the demand for garages to acquire basic knowledge of Autotronics that can be used for maintenance and trouble-shooting for different brands.

• While large car garages with exclusive contracts with major car brands are responding to the growing demands for employee qualification with more extensive training budgets and systematic continuing education courses, the small and medium size garages are at a structural disadvantage in terms of staff training and development, due to limited financial and staffing resources.

This programme of study aims to

- Outline the advantages of Autotronics applications in motor vehicle technology.
- Outline the basics of electronic control (sensing, data processing, actuating, closed loop).
- Describe the structure and the functional operation of vehicle sensors and actuators.
- Explain how engine computer controlled systems work.
- Explain how automotive chassis related computer controlled systems work
- List and describe the principle of operation of modern vehicles diagnostic tools & equipment.
- List and describe the used modern motor vehicles diagnostic techniques.

Course details are available in the Syllabi of the Programme

3. M. Tech (Cognitive Computing)

Cognitive Computing simulates human thought processes in a computerized model. It focuses on self-learning and self-managing systems that use artificial intelligence (machine learning, data mining, pattern recognition, natural language processing, etc.) to mimic the way the human brain works.

In this Master's specialisation, students learn about how models based on neural information processing can be used to develop artificial systems, such as neuromorphic hardware and deep neural networks, as well as the development of new computational models, machine learning approaches, and classification techniques to better understand how the human brain realizes cognition. While targeting the automatic decision-making and problem-solving, the Cognitive Computing systems are able to learn their behaviour through education. They support forms of expression that are more natural for human interaction, which allows them to interpret data regardless of how it is communicated. The primary value is their expertise and the ability to continuously evolve at enormous scale as

they experience new information, scenarios and responses. Cognitive Computing as a technology enables various forms of intelligence interact naturally to collaboratively address complex problems. The technology relies on advances in the study of Collective Intelligence, in regards to not only physical groups of humans, but more to the conceptual and mechanical systems we build. Cognitive Computing and Collective Intelligence is the only way nowadays to address the complexity challenges related to the Big Data and the Internet of Things. Combination of these technologies and challenges is resulting to qualitatively new and efficient Smart Cyber-Physical Systems and Industry 4.0. The students will have concrete understanding about fundamental questions with respect to the brain and cognition, like how we can explain and make sense of our sensory inputs, and how the brain can be so remarkably efficient given bounded resources.

The PG programme on Cognitive Computing focus leads to a highly interdisciplinary AI programme where students gain skills and knowledge from a number of different areas such as mathematics, computer science, psychology and neuroscience combined with a core foundation of artificial intelligence. The Master's students are facilitating to use state-of-the-art facilities available in the campus and industries. Course details are available in the Syllabi of the Programme

4. M.E (Education for Sustainable Development)

India played a prominent role in the formulation of the United Nations Sustainable Development Agenda 2030 and much of the country's National Development Agenda is mirrored in the Sustainable Development Goals (SDGs). The progress of the world to meet the SDGs largely depends on India's progress. However, with 17 Goals, 169 Targets and 306 National indicators, the SDGs might be difficult to grasp and understand, and defining and measuring success poses a challenge. While countries around the world have been considering how to implement and measure success against the Goals, NITI Aayog has taken the lead by bringing out the SDG India Index, and showing how SDGs will be measured in India. To prepare sustainable knowledge society it is imperative to provide master's or research programme in the area of SD.

NITTTR Chennai has a legacy of conducting training programme in the area of "Sustainable Development and Environmental Management" for more than one decade. More than 150 participants from ITEC countries attended this course. Owing to its success, it is proposed to offer Master's Programme in Education for Sustainable Development (ESD). The programme is centered on the question of how

education can support critical inquiry and be a positive force for transformation and change towards a more sustainable future. As a student of the programme, they will be prepared not only to respond to local and global sustainability challenges, but to counteract them and contribute to more sustainable futures through education and research.

This programme of study aims to present students with:

- o different perspectives of (i) the environment, (ii) environmental education/education for sustainable development, (iii) the interaction between the environment and society, and (iv) sustainable development.
- o different environmental and educational philosophical perspectives
- about/through/for approaches to ESD
- various educational contexts within the formal, non-formal and informal sectors
- o experiences of different qualitative and quantitative research methods, and
- opportunities to manage and evaluate change.
 Moreover, each study unit offered will also have a very strong practical component providing prospective students with first hand experiences of current and prospective sustainable development issues. Course details are available in the Syllabi of the Programme

5. M.Tech (Smart Infrastructure Engineering and Management)

Smart Infrastructure intelligently connects energy systems, buildings and industries to adapt and evolve the way we live and work. Specific focus on energy, water and land management; green areas; smart technology and the use of sustainable, durable infrastructure development and management. Especially to create an ecosystem that intuitively responds to the needs of the society. It help communities to progress and supports sustainable development. It provides the flexible infrastructure to allow society to evolve and respond to changing conditions. Technology and the ingenuity of people come together to be at one with our environments and to care for our world. To prepare sustainable knowledge society it is imperative to provide master's or research programme in the area of Smart Infrastructure Engineering and Management.

NITTTR Chennai has a legacy of conducting training programme in the area of "Smart Infrastructure Development", "Sustainable Development and Environmental Management", and "Smart City Development" for more than one decade. More than

150 participants from countries attended these courses. Owing to its success, it is proposed to offer Master's Programme in *Smart Infrastructure Engineering and Management* (SIE&M). The programme is centered on the question of how education can support critical inquiry and be a positive force for transformation and change towards a smarter and sustainable future. As a student of the programme, they will be prepared not only to respond to local and global sustainability challenges, but to counteract them and contribute to more sustainable futures through education and research.

This programme of study aims to:

- Deliver optimal social, environmental and economic outcomes of smart infrastructure development by considering the complex interlinkages between different infrastructure systems, sectors, phases, governance structures, and aspects of sustainability.
- Develop and support integrated approaches to smart and sustainable infrastructure planning and development.
- Facilitate knowledge concerning the nexuses between smart infrastructure and critical environmental issues.
- Experience of different qualitative and quantitative research methods, and opportunities to manage and evaluate change.
 Moreover, each study unit offered will also have a very strong practical component providing prospective students with first hand experiences of current and prospective smart infrastructure development issues. Course details are available in the Syllabi of the Programme

6. M.Tech (Society 5.0)

India played a key role in the progress of the whole world because of the demographic strength. Advance Technology like Industry 4.0, 5G, 6G, Robotics, Blockchain, Mixed Reality list goes on. For most of the advanced technology, which is needed for building any advance systems is none other than SOCIETY 5.0. A human-centred society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space. Society 5.0 achieves a high degree of convergence between cyberspace (virtual space) and physical space (real space). In Society 5.0, however, people, things, and systems are all connected in cyberspace and optimal results obtained by AI exceeding the capabilities of humans are fed back to physical space. This process brings new value

to industry and society in ways not previously possible. By considering the need in terms of new development as well as preparing the human resources for the SOCIETY 5.0, NITTTR Chennai has planned to start a Masters Programme in SOCIETY 5.0. Always NITTTR courses and programs are designed in such a way to meet the National and International requirements particularly in preparing the Human resources for the need.

The SOCIETY 5.0 safety is one of the important and potential research directions recent days. Ongoing advances in science and engineering is going to improve the link between computational and physical elements by means of intelligent mechanisms, dramatically increasing the adaptability, autonomy, efficiency, functionality, reliability, safety, and usability of cyber-physical systems. The transformation of physical systems into cyber-physical systems (CPS) by imbibing them with intelligence is an ongoing process that can substantially benefit the society and the environment by improving comfort, convenience and quality of life of the people, while reducing consumption of natural resources and reducing environmental footprint. Examples of such systems are Smart Grid Networks, Smart Transportation System, Enterprise Cloud Infrastructure, Utility Service Infrastructure for Smart Cities, etc.

This programme of study aims to present students with the following areas:

- Technologies for Internet of Things and Everything (IOT & IOE), Sensors,
 Activators and Control
- Cyber Physical Systems
- Artificial Intelligence and Machine Learning
- Databanks & Data Services, Data Analytics
- Advanced Communication Systems
- Robotics & Autonomous Systems
- Cyber Security and Cyber Security for Physical Infrastructure

Each stream will have a detailed hands-on session to enable the students to take a challenging role. Course details are available in the Syllabi of the Programme

7. MBA (International Education Policy)

In the 21st century, marked by the rapid pace of global change, comparative and international education has become of paramount importance. Needed improvements in equity, social justice, and our ability to promote sustainable development and international peace at a global level require transforming our educational and social institutions. New actors in these processes have become important, such as non-governmental organizations and coalitions of civil society. By understanding and critically reflecting on current policies, practices, and conditions, the goal of the International Education Policy (IEP) program is to contribute to educational and social change. The IEP program aims at creating a community of faculty, students, and development professionals that strives to further cross-cultural and multicultural understanding and bridge the gap between scholars and practitioners.

The IEP program is designed to provide the knowledge and skills necessary for an interdisciplinary understanding of today's educational policy and practice. NITTTR Chennai has a strong legacy of training the national and international participants and we examine the relation of education to economic, political, and social development in both developing and developed countries at local, national, regional, and global levels. The IEP program gives comprehensive attention to education, considering both formal schooling, from pre-school to higher education, as well as non-formal, adult, and community-based education.

Beyond the core courses, a flexible, individually tailored program is designed for each student that uniquely reflects their background and career goals. Students can develop their general skills and competencies in the field or choose to specialize in one or more areas. Course details are available in the Syllabi of the Programme

8. MBA (Educational Transformation)

The next generation of students — dubbed Generation Z, or iGen — will soon be flooding into higher education. Millennials may be tech savvy, but Gen Z students are in a whole new league. They're tech natives, spending nearly their entire lives immersed in technologies that are crucial to living and learning.

To educate these students effectively, professors may need to adapt their pedagogical and Andragogic approaches. That said, there are simple steps educators can take and intriguing new tools at their disposal to help iGen learners get the best education possible. Generation Z is accustomed to personalizing everything. A University Business survey found 66 percent of higher education leaders are researching the use of artificial intelligence to analyze student data in order to personalize learning.

Today's educational leaders seek to transform their education policy programs and connect with students in new ways. Educational organizations are constantly setting new goals and making sweeping changes to serve their students more effectively. It takes real knowledge and outside-the-box thinking to make effective changes. Under this scenario, it has been felt that it is very pertinent to offer a MBA programme on Educational Transformation.

- The subjects so identified are mapped against the identified components of educational transformation.
- MBA in Educational Transformation degree program gives educators the foundation they need to lead significant initiatives in education policy to get meaningful results.

Course details are available in the Syllabi of the Programme

Research Programme

NITTTR Chennai embraces "Research First" and "Open-door" as the basic principles, and advocates "practice-oriented research and education" based on *creative* researches, and always opens its doors to the world as a research-intensive Institution. By establishing a "global center of excellence for intellectual creativity" backed by vision and professionalism, the NITTTR Chennai aims to solve various difficult problems faced by modern society and to fulfill its obligations to the future of humanity and the earth.

The research purposes are to foresee future problems through pursuit of truth as a "global center of excellence for intellectual creativity", to respond to current social demands, and to contribute to the creation and development of scientific technologies with the aim of realizing an affluent society and natural environment for humanity. At the same time, the NITTTR Chennai aims to create excellent educational resources and an excellent educational environment through frontline researches.

To achieve the vision of the research excellence, NITTTR Chennai has prepared the following objectives.

- To lead the academic world and conduct internationally high-level researches in each engineering field.
- To discover new phenomena and create new technologies, based on principles and rules in natural phenomena and pursuit of truth in each engineering field.

- To conduct cutting-edge researches to lead the academic and industrial worlds at home and abroad and create and develop new academic and technological fields.
- To conduct researches that contribute to the development of human resources who can play a leading and core role in society and researchers who can conduct cutting-edge researches.
- To raise research levels to global standards and aim to activate and advance researches further.
- To establish an organizational structure in which flexible responses to crosscutting research systems, including cutting-edge fields and new fields, are possible, despite the basic principle that classes and majors in the same field should be emphasized.
- To develop a research performance evaluation system to encourage the teaching staff to carry out research activities.
- To conduct self-assessment and actively incorporate results of external evaluations with a view to improving the quality of researches and extending researches to interdisciplinary domains.

NITTTR Chennai has proposed research programmes in the following departments / Centres. The departments / centres are having well established laboratory facilities to conduct the PG rpgrammes and Research programmes.

Research Programme (Ph.D) Details

Currently, NITTTR Chennai has been offering research programmes leading to Ph.D in the department of Civil and Environmental Engineering and Engineering Education. In addition to the existing research programmes, NITTTR Chennai wish to offer research programmes in the following departments and centres based on the expertise and infrastructure facilities available.

Departments / Centres to offer Research Programme

- 1. Department of Electrical, Electronics and Communication Engineering
- 2. Department of Computer Science and Engineering
- 3. Department of Mechanical Engineering
- 4. Centre for International Affairs
- 5. Centre for Educational Media and Technology







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M. Tech in Learning, Design, and Technology

The master's program in Learning, Design, and Technology aims to develop knowledge and competencies needed in modern education, namely skills for designing, conducting, assessing, and analyzing versatile learning situations both in face-to-face and technology-enhanced learning contexts. The program equips the students with a combination of strong theoretical knowledge of learning and collaboration, and diverse use of technology and social media that promotes learning. It can enhance in-person learning and bring classrooms to life virtually that can be applied in school education or in adult learning, workforce training or other instructional design environments. They will also know how to develop multimedia content, extending the classroom to online and mobile learning environments, and assess the effectiveness of technology to support student learning.

Through projects, Master students will conduct research on the impact of new technologies in education and learning that provide opportunities to take on authentic, real-world challenges, by applying current research and learning theories to the practice of learning and instructional design, together with the use of emerging technologies.

Programme Outcomes

After completing the Master of Technology programme in Learning, Design, and Technology will be able to:

- Demonstrate the ability to select and use appropriate technologies of learning management systems, social media platforms, and video production for enhancing teaching-learning processes
- Design and implement transformative, personalized online and hybrid learning systems based on human information processing, learning principles, educational theories, and applications of educational technology
- Develop courseware and media products to support teaching, learning, and training
- Analyse data and create visualization models to inform learning design
- Create authentic assessment strategies to evaluate online learning
- Evaluate emerging technology themes of assistive technologies, immersive technologies, simulations, users - generated content for effective from learning activities
- Identify potential issues or gaps, measure learner engagement, and predict trends to

improve the process of learning or the structure of the course by analyzing the user generated data from learning activities.

Career Pathways

The Master's Degree Programme in Learning, Design, and Technology (LDT) prepares the students for a variety of career pathways in the field of education, both nationally and internationally:

0	Instructional designer	0	User-experience designer
0	Learning technologist	0	Learning-assessment developer
0	Learning media producer	0	Human-factors researcher
0	Instructional coach	0	Professional learning and development
0	Curriculum designer		manager
0	Product designer	0	Digital-learning designer

SI.	NAME OF THE PROGRAMME: M.Tech.in LEARNING DEISGN, AND TECHNOLOGY								
No.	Course Category	Credit	s per S	emeste	r	Credits			
	course category	I	II	III	IV	Total			
1	Foundation Course (FC)	4	0	0	0	4			
2	Programme Core Courses (PCC)	12	10	0	0	22			
3	Programme Elective Courses (PEC)	8	8	0	0	16			
4	Research Methodology and IPR Courses (RMC)	0	2	0	0	2			
5	Open Elective Courses (OEC)	0	3	0	0	3			
6	Employability Enhancement Courses (EEC)	0	1	12	12	25			
7	Audit Courses (AC) - Non Credit	√	√	0	0	0			
	Total Credit	24	24	12	12	72			

FOUNDATION COURSES (FC)

S.No	Course Title	Pe	riods per We	Credits	Semester	
		Lecture	Tutorial	Practical		
1	Probability and Statistical Methods	3	1	0	4	1

PROGRAMME CORE COURSES (PCC)

S.No	Course Title	Pe	eriods per W	Credits	Semester	
		Lecture	Tutorial	Practical	0.00.00	• Commodation
1	Educational Technology	3	0	0	3	1
2	Instructional System Design	3	0	0	3	1
3	Video Production for Teaching and Learning	3	0	2	4	1
4	Educational Technology Tools	0	0	4	2	1
5	Immersive Technology	3	0	2	4	2
6	Educational Data Mining and Learning Analytics	3	0	2	4	2
7	Graphics, Animation and Game Programming	0	0	4	2	2

PROGRAMME ELECTIVE COURSES (PEC)

S.No	Course Title	Pe	riods per W	Credits	Semester	
3.110		Lecture	Tutorial	Practical	Cicuits	Semester
1	Learning Sciences	3	0	2	4	1
2	Foundations of Curriculum, Instruction and Assessment	3	0	2	4	1
3	Artificial Intelligence	3	0	2	4	1
4	Adaptive Tutoring System	3	0	2	4	1
5	Educational Neuroscience	3	0	2	4	1
6	Graphics and Animation	3	0	2	4	1
7	Design of Learning Environment	3	0	2	4	2
8	Human Computer Interaction Techniques	3	0	2	4	2
9	Game Design	3	0	2	4	2
10	Animation Techniques	3	0	2	4	2
11	Visualization Techniques	3	0	2	4	2
12	Educational Application Design	3	0	2	4	2

RESEARCH METHODOLOGY AND IPR COURSES (RMC)

S.No	Course Title	P	eriods per V	Credits	Semester	
3.110		Lecture	Tutorial	Practical	0.00.00	
1	Research Methods in Instructional	2	0	0	2	2
ı	Technology		,	Ü	_	

OPEN ELECTIVE COURSES (OEC) (Out of Six Course - One Course need to be selected)

S.No	Course Title	Pe	eriods per \	Credits	Semester	
5	Course Title	Lecture	Tutorial	Practical	Credits	Semester
1	Project Management in Instructional Design	3	0	0	3	2
2	Business Data Analytics	3	0	0	3	2
3	Digital Marketing	3	0	0	3	2
4	Assistive Technology for Learning	3	0	0	3	2
5	Essential of Entrepreneurship	3	0	0	3	2
6	Waste to Energy	3	0	0	3	2

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

S.No		P	eriods per V	Credits	Semester	
5,1,10		Lecture	Tutorial	Practical		
1	Technical Seminar	0	0	2	1	2
2	Dissertation Phase I	0	0	24	12	3
3	Dissertation Phase II	0	0	24	12	4
		25				

AUDIT COURSES (AC) (Registration for any of these courses is optional to students)

S.No	Course Title	Pe	eriods per \	Week	Credits	
3.110		Lecture	Tutorial	Practical	Credits	
1	English for Research Paper Writing	2	0	0	0	
2	Disaster Management	2	0	0	0	
3	Sanskrit for Technical Knowledge	2	0	0	0	
4	Value Education	2	0	0	0	
5	Constitution of India	2	0	0	0	
6	Pedagogy Studies	2	0	0	0	
7	Stress Management by Yoga	2	0	0	0	
8	Personality Development through life - Enlightenment Skills	2	0	0	0	
9	Unnat Bharat Abhiyan	2	0	0	0	
10	Inclusive Education	2	0	0	0	
Total Credits						

SEMESTER I

S.No	Course Title	Category	Pe	eriods per \	Week	Credits
	553.132 3.000		Lecture	Tutorial	Practical	0.00.00
1	Probability and Statistical Methods	FC	3	1	0	4
2	Educational Technology	PCC	3	0	0	3
3	Instructional System Design	PCC	3	0	0	3
4	Video Production for Teaching and Learning	PCC	3	0	2	4
5	Elective-I	PEC	3	0	2	4
6	Elective-II	PEC	3	0	2	4
7	Educational Technology Tools Lab	PCC	0	0	4	2
8	Audit Course I*	AC	2	0	0	0
			1	To	otal Credits	24

SEMESTER II

S.No	Course Title	Category	Pe	eriods per '	Week	Credits
	555		Lecture	Tutorial	Practical	
1	Research Methods in Instructional Technology	RMC	2	0	0	2
2	Immersive Technology	PCC	3	0	2	4
3	Educational Data Mining and Learning Analytics	PCC	3	0	2	4
4	Elective-III	PEC	3	0	2	4
5	Elective-IV	PEC	3	0	2	4
6	Open Elective	OEC	3	0	0	3
7	Graphics, Animation and, Game Programming Lab	PCC	0	0	4	2
8	Audit Course II*	AC	2	0	0	0
9	Seminar	EEC	0	0	2	1
			ı	To	otal Credits	24

SEMESTER III

S.No Course Title		Category	Pe	Periods per Week			
			Lecture	Tutorial	Practical		
1	Dissertation Phase I	EEC	0	0	24	12	
				To	otal Credits	12	

SEMESTER IV

S.No	Course Title	Category	Pe	Periods per Week		
			Lecture	Tutorial	Practical	
1	Dissertation Phase II	EEC	0	0	24	12
Total Credits						12

TOTAL CREDITS 72

M. Tech in Autotronics

This programme of study aims to

- Outline the advantages of Autotronics applications in motor vehicle technology.
- Outline the basics of electronic control (sensing, data processing, actuating, closed loop).
- o Describe the structure and the functional operation of vehicle sensors and actuators.
- o Explain how engine computer controlled systems work.
- o Explain how automotive chassis related computer controlled systems work
- List and describe the principle of operation of modern vehicles diagnostic tools & equipment.
- List and describe the used modern motor vehicles diagnostic techniques.

Programme Outcomes

- 1. To demonstrate strong basics in mathematics, science and Engineering
- 2. To demonstrate the ability to design and conduct Experiments, as well as to analyze and interpret data.
- To demonstrate the ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and Safety, manufacturability and sustainability.
- 4. To become familiar with modern Engineering tools and analyse the problems within the domains of Automobile Engineering as the members of multidisciplinary teams.
- 5. To acquire the capability to identify, formulate and solve complex engineering problems related to Automobile Engineering
- 6. To demonstrate and understanding of professional and ethical responsibility with reference to their career in the field of Automobile Engineering
- 7. To communicate effectively both in verbal non-verbal forms
- 8. To train towards developing the impact of development of Automobile engineering on global, economic environment and societal context

- 9. To capable of understanding the value for life-long learning
- 10. To demonstrate knowledge of contemporary issues focusing on the necessary to develop new material, design, and engineering practice in the field of Automobile Engineering
- 11. To demonstrate the ability to use the techniques, skills and Modern engineering tools necessary for engineering practice in the field of Automobile Engineering
- 12. To do their higher studies and research in inter and multidisciplinary areas.

SI.	NAME OF THE PROGRAMME: M.Tech in Autotronics								
No.	Course Category		lits pe	r Semes	ter	Credits			
	Course Category	I	II	III	IV	Total			
1	Foundation Course (FC)	4	0	0	0	4			
2	Programme Core Courses (PCC)	14	13	0	0	27			
3	Programme Elective Courses (PEC)	3	6	3	0	12			
4	Research Methodology and IPR Courses (RMC)	2	0	0	0	2			
5	Open Elective Courses (OEC)	0	0	2	0	2			
6	Employability Enhancement Courses (EEC)	0	0	10	12	18			
7	Audit Courses (AC) - Non Credit	✓	✓	0	0	0			
	Total Credit	23	19	15	12	69			

FOUNDATION COURSES (FC)

S.No	Course Title	Periods per Week			Credits	Semester
3.110		Lecture	Tutorial	Practical	Credits	Jemeste.
1	Statistical Methods for Engineers	3	1	0	4	1

PROGRAMME CORE COURSES (PCC)

S.No	Course Title	Pe	eriods per \	Week	Credits	Semester
3.110	course ricie	Lecture	Tutorial	Practical	Credits	
1	Engines & Sub systems	3	0	2	4	1
2	Power Train Transmission	3	0	2	4	1
3	Automobile Chassis	3	0	0	3	1
4	Electric and Hybrid vehicles	3	0	0	3	1
5	Engine Management System	3	0	2	4	2
6	Instrumentation and Experimental Techniques	3	0	2	4	2
7	Automobile Electrical and Electronics	3	0	0	3	2
8	Automobile Laboratory	0	0	4	2	2

PROGRAMME ELECTIVE COURSES (PEC)

S.No	Course Title	Р	eriods per V	Veek	Credits	Semester
5.110	Course Trace	Lecture	Tutorial	Practical	Credits	Jemester
1	Automotive Aerodynamics	3	0	0	3	1
2	IC Engine process Modeling	3	0	0	3	1
3	Vehicle Design and Data Characteristics	2	1	0	3	1
4	Automotive Safety	2	1	0	3	2
5	Hydraulic and Pneumatic Systems	3	0	0	3	2
6	Advanced Thermodynamics for Automobile Engineers	3	0	0	3	2
7	Special Types of Vehicles	3	0	0	3	2
8	Combustion Thermodynamics and Heat	3	0	0	3	2
9	Finite Element Methods in Automobile Engineering	2	0	2	3	2
10	Computational Fluid Dynamics for Thermal Systems	3	0	0	3	3
11	Simulation of Vehicle systems	3	0	0	3	3
12	Automotive Testing and Certification	3	0	0	3	3

RESEARCH METHODOLOGY AND IPR COURSES (RMC)

S.No	Course Title	P	eriods per V	Credits	Semester	
	Lecture Tutorial Practical	Practical	9 . 9 a. 139			
1	Research Methodology and IPR	2	0	0	2	1

OPEN ELECTIVE COURSES (OEC) (Out of Six Course - One Course need to be selected)

S.No	Course Title	Pe	eriods per \	Credits	Semester	
		Lecture	Tutorial	Practical		
1	Alternative Fuels	3	0	0	3	3
2	Production of Automobile Components	3	0	0	3	3
3	Automotive Pollution and Control	3	0	0	3	3
4	Automotive Air Conditioning Systems	3	0	0	3	3
5	Vehicle Maintenance	3	0	0	3	3
6	Vehicle Body Engineering	3	0	0	3	3

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

S.No	Course Title	Periods per Week			Credits	Semester	
5,1,10		Lecture	ure Tutorial Practical		G. Guits	Jennester .	
1	Technical Seminar	0	0	2	2	3	
2	Dissertation Phase I	0	0	16	8	3	
3	Dissertation Phase II	0	0	24	12	4	

AUDIT COURSES (AC)

(Registration for any of these courses is optional to students)

		Peri	/eek	
S.No	Course Title	Lecture	Tutori al	Practical
1	English for Research Paper Writing	2	0	0
2	Transport Management	2	0	0
3	Sanskrit for Technical Knowledge	2	0	0

	Course Title	Periods per Week				
S.No		Lecture	Tutori al	Practical		
4	Value Education	2	0	0		
5	Constitution of India	2	0	0		
6	Pedagogy Studies	2	0	0		
7	Stress Management by Yoga	2	0	0		
8	Personality Development through life - Enlightenment Skills	2	0	0		
9	Unnat Bharat Abhiyan	2	0	0		

Semester I

S.No	Course Title	Periods per Week			Credits	
		Lecture	Tutorial	Practical		
1	Engines & Sub systems	3	0	2	4	
2	Power Train Transmission	3	0	2	4	
3	Automobile Chassis	3	0	0	3	
4	Electric and Hybrid vehicles	3	0	0	3	
5	Statistical Methods for Engineers	3	1	0	4	
6	Research Methodology and IPR	2	0	0	2	
7	Programme Elective - 1	3	0	0	3	
		•		Total Credits	23	

Semester II

S.No	Course Title	Pe	Credits		
31110		Lecture	Tutorial	Practical	G. Guids
1	Engine Management System	3	0	2	4
2	Instrumentation and Experimental Techniques	3	0	2	4
3	Automobile Electrical	3	0	0	3

S.No	Course Title	Pe	Credits		
3.110		Lecture	Tutorial	Practical	Credits
	and Electronics				
4	Automobile Laboratory	0	0	4	2
5	Programme Elective - 2	3	0	0	3
6	Programme Elective - 3	3	0	0	3
7	Audit Course	2	0	0	0
			To	otal Credits	19

Semester III

S.No	Course Title	Pe	Credits		
5.110		Lecture	Tutorial	l Practical	Credits
1	Programme Elective - 4	3	0	0	3
2	Open Elective	2	0	0	2
3	Technical Seminar	0	0	2	2
3	Project Phase - I	0	0	16	8
Total Credits					15

Semester - IV

S.No	Course Title	Periods per Week			Credits	
		Lecture	Tutorial	Practical		
1	Project Phase - II	0	0	24	12	
Total Credits						

M.Tech in Cognitive Computing

Introduction

The PG programme on Cognitive Computing focus leads to a highly interdisciplinary AI programme where students gain skills and knowledge from a number of different areas such as mathematics, computer science, psychology and neuroscience combined with a core foundation of artificial intelligence. The Master's students are facilitating to use state-of-the-art facilities available in the campus and industries.

Programme Outcomes

- Able to design complex self-managed and continuously evolving public and private industrial systems, digital ecosystems, cyber-physical systems, systems-of-systems, platforms, services and applications
- Able to use and develop artificial systems, such as neuromorphic hardware and deep neural networks, as well as the development of new computational models, machine learning approaches, and classification techniques to better understand how the human brain realizes cognition.
- Able to connect their designs with publicly available Deep Learning and Big Data analytics and Web-based Cognitive Computing capabilities as services.
- Able to figure-out and approach various challenging aspects of complex problems world-wide, which require collective intelligence and self-managing service-based architectures for their solutions;
- Able to understand, and professionally utilize for that purpose, knowledge on enabling technologies and tools;
- Able to perform research training and academic doctoral level studies
- Able to understand a range of experimental approaches are used to measure and analyse brain function

PEDAGOGICAL APPROACHES IN COGNITIVE COMPUTING

Pedagogical approach is a kind science to explore new strategies to apply in the Teaching -Learning Process, All the courses of this programme are focus more on active and creative learning strategies and experiential learning methods that engage the learner and make a real difference to their understanding, thinking and ability to act.

We've identified five pedagogic elements that cover a host of pedagogical approaches that might use to bring these elements into the learning environment.

- 1. **Critical reflection** including the more traditional lecture, but also newer approaches such as reflexive accounts, learning journals, and discussion groups.
- Systemic thinking and analysis the use of real-world case studies and critical
 incidents, project-based learning, stimulus activities, and the use of the campus as
 a learning resource.
- 3. **Participatory learning** with emphasis on group or peer learning, developing dialogue, experiential learning, action research/learning to act, and developing case studies with local community groups and business
- 4. **Thinking creatively for future scenarios** by using role play, real-world inquiry, futures visioning, problem-based learning, and providing space for emergence.
- 5. **Collaborative learning** including contributions from guest speakers, work-based learning, interdisciplinary/ multidisciplinary working, and collaborative learning and co-inquiry.

SI.	NAME OF THE PROGRAMME: M.Tech in Cognitive Computing						
No.	Course Category	Cred	lits pe	r Semes	ter	Credits	
		I	II	III	IV	Total	
1	Foundation Course (FC)	4	0	0	0	4	
2	Programme Core Courses (PCC)	14	14	0	0	28	
3	Programme Elective Courses (PEC)	3	6	3	0	12	
4	Research Methodology and IPR Courses (RMC)	2	0	0	0	2	
5	Open Elective Courses (OEC)	0	0	3	0	3	

SI.	NAME OF THE PROGRAMME: M.Tech i	in Cogn	itive C	omputir	ng	
No.	No. Course Category		lits pe	r Semes	ter	Credits
			II	III	IV	Total
6	Employability Enhancement Courses (EEC)	0	0	8	12	20
7	Audit Courses (AC) - Non Credit	✓	✓	0	0	0
	Total Credits	23	20	14	12	69

FOUNDATION COURSES (FC)

S.No	Course Title	Periods per Week		Credits	Semester	
3.110	555.155 1.5.5	Lecture	Tutorial	Practical	or cures	0000.
1	Mathematical Foundations for	3	1	0	4	1
'	Cognitive Computing		'	Ü	7	'

PROGRAMME CORE COURSES (PCC)

S.No	Course Title	Р	eriods per V	Veek	Credits	Semester
		Lecture	Tutorial	Practical		
1	Machine Learning	3	0	2	4	1
2	Artificial Intelligence and Intelligent Systems	3	0	2	4	1
3	Natural Language Processing	3	0	0	3	1
4	Human Computer Interaction	3	0	0	3	1
5	Deep Learning	3	0	2	4	2
6	Big Data Analytics	3	0	2	4	2
7	Knowledge Discovery	3	0	0	3	2
8	Cognitive Neuroscience	3	0	0	3	2

PROGRAMME ELECTIVE COURSES (PEC)

S.No	Course Title	Pe	eriods per W	eek	Credits	Semester
3.110	Course Title	Lecture	Tutorial	Practical	Credits	Jeillestei
1	Neural Network and Fuzzy Logic	3	0	0	3	1
2	Data Analysis for Behavioural Research using Python	3	0	0	3	1
3	Language Technologies	3	0	0	3	1
4	Machine Translation	3	0	0	3	2
5	Advanced Computational Methods	3	0	0	3	2
6	Cognitive Psychology	3	0	0	3	2
7	Agent Based Intelligent System	3	0	0	3	2
8	Reinforcement Learning	3	0	0	3	2
9	Network Science and Modelling	3	0	0	3	2
10	Computer Vision	3	0	0	3	2
11	Evolutionary Computing	3	0	0	3	2
12	Intelligent Information Retrieval	3	0	0	3	2
13	Stochastic Models and Applications	3	0	0	3	3
14	Soft Computing Techniques	3	0	0	3	3
15	Virtual Reality and Augmented Reality	3	0	0	3	3
16	Advances in Social Cognition	3	0	0	3	3

RESEARCH METHODOLOGY AND IPR COURSES (RMC)

S.No	Course Title	Pe	Periods per Week			Semester
5.1 .(5		Lecture	Tutorial	Practical		
1	Research Methodology and IPR	2	0	0	2	1

OPEN ELECTIVE

S.No	Course Title	Pe	eriods per W	eek	Credits	Semester
		Lecture	Tutorial	Practical		
1	Pattern Recognition	3	0	0	3	3
2	Business Data Analytics - Case Study	3	0	0	3	3
3	Computation and Cognition	3	0	0	3	3

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

S.No	Course Title	Periods per Week			Credits	Semester
		Lecture	Tutorial	Practical		
1	Dissertation Phase I	0	0	16	8	3
2	Dissertation Phase II	0	0	24	12	4

AUDIT COURSES (AC)

(Registration for any of these courses is optional to students)

S.No	Course Title	P	eriods per Week	
5. 11.15		Lecture	Tutorial	Practical
1	English for Research Paper Writing	2	0	0
2	Disaster Management	2	0	0
3	Sanskrit for Technical Knowledge	2	0	0
4	Value Education	2	0	0
5	Constitution of India	2	0	0
6	Pedagogy Studies	2	0	0
7	Stress Management by Yoga	2	0	0
8	Personality Development through life - Enlightenment Skills	2	0	0
9	Unnat Bharat Abhiyan	2	0	0

Semester - I

S.No	Course Title	Р	eriods per V	Veek	Credits
		Lecture	Tutorial	Practical	
1	Mathematical Foundations for Cognitive Computing	3	1	0	4
2	Machine Learning	3	0	2	4
3	Artificial Intelligence and Intelligent Systems	3	0	2	4
4	Natural Language Processing	3	0	0	3
5	Human Computer Interaction	3	0	0	3
6	Research Methodology and IPR	2	0	0	2
7	Programme Elective - 1	3	0	0	3
		•	Т	otal Credits	23

Semester - II

S.No	Course Title	Р	eriods per W	/eek	Credits
		Lecture	Tutorial	Practical	
1	Deep Learning	3	0	2	4
2	Big Data Analytics	3	0	2	4
3	Knowledge Discovery	3	0	0	3
4	Cognitive Neuroscience	3	0	0	3
5	Programme Elective - 2	3	0	0	3
6	Programme Elective - 3	3	0	0	3
7	Audit Course	2	0	0	0
		,	T	otal Credits	20

Semester - III

S.No	Course Title	P	Credits		
5.110		Lecture	Tutorial	Practical	Credits
1	Programme Elective - 4	3	0	0	3
2	Open Elective	3	0	0	3
3	Project Phase - I	0	0	16	8
			T	otal Credits	14

Semester - IV

S.No		Р	Credits		
		Lecture	Tutorial	Practical	0.01.00
1	Project Phase - II	0	0	24	12
		Total Credits			12

M.E in Education for Sustainable Development

Introduction

NITTTR Chennai has a legacy of conducting training programme in the area of "Sustainable Development and Environmental Management" for more than one decade. More than 150 participants from countries attended this course. Owing to its success, it is proposed to offer Master's Programme in Education for Sustainable Development (ESD). The programme is centered on the question of how education can support critical inquiry and be a positive force for transformation and change towards a more sustainable future. As a student of the programme, they will be prepared not only to respond to local and global sustainability challenges, but to counteract them and contribute to more sustainable futures through education and research.

This programme of study aims to present students with:

- different perspectives of (i) the environment, (ii) environmental education/education for sustainable development, (iii) the interaction between the environment and society, and (iv) sustainable development.
- different environmental and educational philosophical perspectives
- about/through/for approaches to ESD
- various educational contexts within the formal, non-formal and informal sectors
- experiences of different qualitative and quantitative research methods, and
- opportunities to manage and evaluate change.

Moreover, each study unit offered will also have a very strong practical component providing prospective students with first hand experiences of current and prospective sustainable development issues.

Programme Outcomes

The Master in Education for Sustainable Development will enable students to:

- study issues related to ESD in practice and 'in situ' in different environmental realities.
- experience and compare different environmental, social, cultural, political and educational perspectives.
- access and critically evaluate ESD research.
- employ the skills and attitudes necessary to promote sustainable lifestyles.
- relate with other ESD professionals and civil society in the development of practical
 ESD research projects.
- employ a variety of teaching/learning methods: direct teaching, distance learning, open/negotiable learning and the use of information and communication technologies (ICTs).
- apply skills and strategies in research methodology/inquiry, and
- consolidate the expertise required to function as environmental educators in various contexts within formal, informal and non-formal education sectors.

PEDAGOGICAL APPROACHES IN ESD

There is no 'correct' pedagogy for sustainability education, but there is a broad consensus that it requires a shift towards active, participative, and experiential learning methods that engage the learner and make a real difference to their understanding, thinking and ability to act.

We've identified five pedagogic elements that cover a host of pedagogical approaches that might use to bring these elements into the learning environment.

- 1. **Critical reflection** including the more traditional lecture, but also newer approaches such as reflexive accounts, learning journals, and discussion groups.
- Systemic thinking and analysis the use of real-world case studies and critical
 incidents, project-based learning, stimulus activities, and the use of the campus as
 a learning resource.
- Participatory learning with emphasis on group or peer learning, developing dialogue, experiential learning, action research/learning to act, and developing case studies with local community groups and business

- 4. Thinking creatively for future scenarios by using role play, real-world inquiry, futures visioning, problem-based learning, and providing space for emergence.
- 5. **Collaborative learning** including contributions from guest speakers, work-based learning, interdisciplinary/ multidisciplinary working, and collaborative learning and co-inquiry.

SI.	NAME OF THE PROGRAMME: M.E in EDUCATION	FOR SU	ISTAIN	ABLE DI	VELO	PMENT
No.	Course Category		lits pe	r Semes	ter	Credits
			II	III	IV	Total
1	Foundation Course (FC)	4	0	0	0	4
2	Programme Core Courses (PCC)	12	9	3	0	24
3	Programme Elective Courses (PEC)	3	9	6	0	18
4	Research Methodology and IPR Courses (RMC)	2	0	0	0	2
5	Open Elective Courses (OEC)	0	0	3	0	3
6	Employability Enhancement Courses (EEC)	0	1	6	12	19
7	Audit Courses (AC) - Non Credit	✓	√	0	0	0
	Total Credit	21	19	18	12	70

FOUNDATION COURSES (FC)

S.No	Course Title	Periods per Week						Credits	Semester
		Lecture	Tutorial	Practical	0.00.00	•			
1	Statistical Methods for Engineers	3	1	0	4	1			

PROGRAMME CORE COURSES (PCC)

S.No	Course Title	Pe	eriods per \	Week	Credits	Semester	
	303.00	Lecture	Tutorial	Practical	5 , 5 a. 5		
1	Principles of Sustainable Development	3	0	0	3	1	
2	Different Paradigms of Development	3	0	0	3	1	
3	Humans, Society and the Environment	3	0	0	3	1	
4	Theory and Dimensions of Learning	3	0	0	3	1	
5	Environmental Policies and Legislation	3	0	0	3	2	
6	Curriculum Development for Sustainability	3	0	0	3	2	
	Education		, and the second	, and the second		_	
7	Economics of Sustainability	3	0	0	3	2	
8	SDG and index for measurement	3	0	0	3	2	

S.No	S.No Course Title		eriods per \	Week	Credits	Semester
3.1.(5	COM. 50 1100	Lecture	Tutorial	Practical	o. cana	
Q	Design, Technology and Planning for	3	0	0	3	3
	Sustainability		O	U	3	

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PROGRAMME ELECTIVE COURSES (PEC)

S.No	Course Title	Р	eriods per W	/eek	Credits	Semester	
5.110	Course male	Lecture	Tutorial	Practical	Cicais	Semester	
1	Issues and Trends in ESD	3	0	0	3	1	
2	Learning and Training Environment for Transforming ESD	3	1	0	3	1	
3	Social Outreach for Sustainability	2	1	1	3	2	
4	SDG for Education - Targets and Indicators	2	1	1	3	2	
5	Gender and Sustainable Development	3	0	0	3	2	
6	Climate Change and SD	3	0	0	3	2	
7	ESD & Communication	3	0	0	3	2	
8	Transformative pedagogies	3	0	0	3	2	
9	Immersive Technology for teaching ESD	2	1	1	3	2	
10	Corporate Social Responsibility	3	0	0	3	3	
11	Sustainability and Ethical tourism	3	0	0	3	3	
12	ESD in international higher education	3	0	0	3	3	

RESEARCH METHODOLOGY AND IPR COURSES (RMC)

S.No	Course Title	P	Periods per Week			Semester
		Lecture	Tutorial	Practical	Credits	Jemester
1	Research Methodology and IPR	2	0	0	2	1

OPEN ELECTIVE COURSES (OEC) (Out of Six Course - One Course need to be selected)

S.No	Course Title	Pe	riods per W	Credits	Semester		
		Lecture	Tutorial	Practical			
1	Business Data Analytics	3	0	0	3	3	
2	Industrial Safety	3	0	0	3	3	
3	Operations Research	3	0	0	3	3	

S.No	Course Title	Pe	riods per W	Credits	Semester		
	000	Lecture	Tutorial	Practical	0.00.00		
4	Cost Management of Engineering	3	0	0	3	3	
	Projects				3	3	
5	Composite Materials	3	0	0	3	3	
6	Waste to Energy	3	0	0	3	3	

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

S.No	Course Title	Periods per Week			Credits	Semester
		Lecture	Tutorial	Practical		
1	Technical Seminar	0	0	2	1	3
2	Dissertation Phase I	0	0	12	6	3
3	Dissertation Phase II	0	0	24	12	4
		19				

AUDIT COURSES (AC)

(Registration for any of these courses is optional to students)

S.No	Course Title		Periods per W	/eek
		Lecture	Tutorial	Practical
1	English for Research Paper Writing	2	0	0
2	Disaster Management	2	0	0
3	Sanskrit for Technical Knowledge	2	0	0
4	Value Education	2	0	0
5	Constitution of India	2	0	0
6	Pedagogy Studies	2	0	0
7	Stress Management by Yoga	2	0	0
8	Personality Development through life - Enlightenment Skills	2	0	0
9	Unnat Bharat Abhiyan	2	0	0

M. Tech in Smart Infrastructure Engineering and Management

This programme of study aims to:

- Deliver optimal social, environmental and economic outcomes of smart infrastructure development by considering the complex interlinkages between different infrastructure systems, sectors, phases, governance structures, and aspects of sustainability.
- Develop and support integrated approaches to smart and sustainable infrastructure planning and development.
- Facilitate knowledge concerning the nexuses between smart infrastructure and critical environmental issues.
- Experience of different qualitative and quantitative research methods, and opportunities to manage and evaluate change.

Moreover, each study unit offered will also have a very strong practical component providing prospective students with first hand experiences of current and prospective smart infrastructure development issues.

LEARNING OUTCOMES:

The Master in Smart Infrastructure Engineering and Management will enable students to:

- Implement IoT in the infrastructure projects to ensure the sustainable development
- Apply theoretical and practical aspects of project management techniques to achieve project goals.
- Possess organizational and leadership capabilities for effective management of infrastructure projects.
- Apply knowledge and skills of smart infrastructure development and modern construction techniques.
- Develop planning, scheduling, executing and controlling of construction projects.
- Develop and implement BIM process in the smart infrastructure development.

PEDAGOGICAL APPROACHES IN SIE&M

There is a broad consensus that it requires a shift towards active, participative, and experiential learning methods that engage the learner and make a real difference to their understanding, thinking and ability to act.

We've identified five pedagogic elements that cover a host of pedagogical approaches that might use to bring these elements into the learning environment.

- 1. **Critical reflection** including the more traditional lecture, but also newer approaches such as reflexive accounts, learning journals, and discussion groups.
- Systemic thinking and analysis the use of real-world case studies and critical
 incidents, project-based learning, stimulus activities, and the use of the campus as
 a learning resource.
- 3. **Participatory learning** with emphasis on group or peer learning, developing dialogue, experiential learning, action research/learning to act, and developing case studies with local community groups and business
- 4. **Thinking creatively for future scenarios -** by using role play, real-world inquiry, futures visioning, problem-based learning, and providing space for emergence.
- Collaborative learning including contributions from guest speakers, work-based learning, interdisciplinary/ multidisciplinary working, and collaborative learning and co-inquiry.

	NAME OF THE PROGRAMME: M.Tech in Smart Infrastructure Engineering and							
SI.	Management							
No.	Course Category	Cred	lits pe	r Semes	ter	Credits		
		I	II	III	IV	Total		
1	Foundation Course (FC)	4	0	0	0	4		
2	Programme Core Courses (PCC)	11	14	6	0	31		
3	Programme Elective Courses (PEC)	3	6	3	0	12		
4	Research Methodology and IPR Courses (RMC)	2	0	0	0	2		
5	Open Elective Courses (OEC)	0	0	3	0	3		
6	Employability Enhancement Courses (EEC)	0	1	6	12	19		
7	Audit Courses (AC) - Non Credit	√	✓	0	0	0		
	Total Credit	20	21	18	12	71		

FOUNDATION COURSES (FC)

S.No	Course Title	Periods per Week			Credits	Semester	
		Lecture	Tutorial	Practical			
1	Statistical Methods for Engineers	3	1	0	4	1	

PROGRAMME CORE COURSES (PCC)

S.No	Course Title	Pe	riods per V	/eek	Credits	Semester
		Lecture	Tutorial	Practical		
1	Project Management for Infrastructure	3	0	0	3	1
2	Infrastructure Asset Management	3	0	0	3	1
3	Building Information Modeling	2	0	2	3	1
4	Project Management & BIM Laboratory	0	0	4	2	1
5	Green Building	3	0	0	3	2
6	Geographical Information systems for Infrastructure Planning.	3	0	0	3	2
7	IoT and Smart Infrastructures	3	0	0	3	2
8	Sustainability and Infrastructure	3	0	0	3	2
9	GIS Laboratory	0	0	4	2	2
10	Contract Laws and Regulations	3	0	0	3	3
11	Soft Computing Techniques	2	0	2	3	3

PROGRAMME ELECTIVE COURSES (PEC)

S.No	Course Title	Р	eriods per V	Veek	Credits	Semester
3,1,5	5555 15	Lecture	Tutorial	Practical	Si Suiis	
1	Smart Construction Materials and Techniques	3	0	0	3	1
2	Environmental Impact Assessment for Infrastructure Projects	3	1	0	3	1
3	Advanced Structural Design	3	0	0	3	1
4	Smart Transportation Engineering Systems	3	0	0	3	1
5	Material Procurement and Management	2	1	1	3	2
6	Earthquake Analysis and Design of Structures	2	1	1	3	2
7	Health Monitoring of Structures	3	0	0	3	2
8	Maintenance and Rehabilitation of Structures	3	0	0	3	2
9	Safety in Construction Engineering	3	0	0	3	2

S.No	Course Title	P	eriods per V	Credits	Semester	
		Lecture	Tutorial	Practical	G. 5 a5	
10	Disaster Mitigation and Management	3	0	0	3	3
11	Sustainable Development and Urban Planning	2	1	1	3	3
12	Infrastructure systems, Interdependencies and Resilience	3	0	0	3	3

RESEARCH METHODOLOGY AND IPR COURSES (RMC)

S.No	Course Title	Р	eriods per V	Credits	Semester	
		Lecture	Tutorial	Practical		
1	Research Methodology and IPR	2	0	0	2	1

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

S.No	Course Title	P	eriods per V	Credits	Semester	
		Lecture	Tutorial	Practical		
1	Technical Seminar	0	0	2	1	2
2	Dissertation Phase I	0	0	12	6	3
3	Dissertation Phase II	0	0	24	12	4
		19				

OPEN ELECTIVE COURSES (OEC) (Out of Six Course - One Course need to be selected)

S.No	Course Title	eriods per \	Week	Credits	Semester	
		Lecture	Tutorial	Practical		
1	Business Data Analytics	3	0	0	3	3
2	Industrial Safety	3	0	0	3	3
3	Operations Research	3	0	0	3	3
4	Cost Management of Engineering Projects	3	0	0	3	3
5	Composite Materials	3	0	0	3	3
6	Waste to Energy	3	0	0	3	3

M.Tech in Society 5.0

This programme of study aims to present students with the following areas:

- Technologies for Internet of Things and Everything (IOT & IOE), Sensors,
 Activators and Control
- Cyber Physical Systems
- o Artificial Intelligence and Machine Learning
- Databanks & Data Services, Data Analytics
- Advanced Communication Systems
- Robotics & Autonomous Systems
- Cyber Security and Cyber Security for Physical Infrastructure

Each stream will have a detailed hands-on session to enable the students to take a challenging role.

Programme Outcome

The Master Programme in ECE with specialization in Society 5.0 will enable students to:

- o Categorize the essential modelling formalisms of Cyber-Physical Systems (CPS).
- Analyse the functional behaviour of CPS based on standard modelling formalisms.
- o Implement specific software CPS using existing synthesis tools.
- Design Society 5.0 requirements based on operating system and hardware architecture constraints.
- Analyse and verify the correctness of implementations against system requirements and timing constraints.
- Validate of systems by testing.
- Implement design: the principal differences between specification and design models and physical realization in hardware and software including principal design trade-offs and solutions.
- Design Tools for specification, design, implementation and analysis: model-driven development from abstract system models, through design synthesis to code generation and execution.

PEDAGOGICAL APPROACHES IN Society 5.0

A powerful method of science and research endeavor brings us every aspect of our comfort. There is no 'correct' pedagogy for Society 5.0, but there is a broad consensus that it requires a shift towards active, participative, and experiential learning methods that engage the learner and make a real difference to their understanding, thinking and ability to act. Technology, the use of scientific knowledge for practical purposes, has a profound impact on the way we live and on the quality of our lives. We've identified pedagogical approaches that might use to bring these elements into the learning environment.

- Self-Teaching: this approach has many humanistic effects leading to the student's individual personal development. Self-teaching gives to the student a greater degree of self-fulfilment, the liberty of action and the power of control. It helps to Analyzing existing cyber-physical systems.
- Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- Educational-research projects- encourage others to make their software and thoughts freely available so that everyone can learn and appreciate them. Accompany your scientific software with documentation and publish it on your webpage contributes to the globalization and democratization of education and research. Activities like Practical developing, executing and using selected services such as distributed, mobile services using Python based platforms and the ability to use state of the art tools for model driven development.

SI.	NAME OF THE PROGRAMME: M.Tech. Society 5.0								
No.	Course Category	Cred	Credits						
	Course Category	I	II	III	IV	Total			
1	Foundation Course (FC)	4	0	0	0	4			
2	Programme Core Courses (PCC)	14	14	0	0	28			
3	Programme Elective Courses (PEC)	3	6	3	0	12			
4	Research Methodology and IPR Courses (RMC)	2	0	0	0	2			
5	Open Elective Courses (OEC)	0	0	3	0	3			
6	Employability Enhancement Courses (EEC)	0	0	9	12	21			
7	Audit Courses (AC) - Non Credit	✓	✓	0	0	0			
	Total Credit	23	20	15	12	70			

FOUNDATION COURSES (FC)

	S.No	Course Title	Periods per Week			Credits	Semester
5.110		Lecture	Tutorial	Practical	0.00.00		
	1	Mathematics for System Design	3	1	0	4	1

PROGRAMME CORE COURSES (PCC)

S.No	Course Title	Pe	riods per W	/eek	Credits	Semester
	555	Lecture	Tutorial	Practical	0.00.00	0011100101
1	Introduction to Society 5.0	3	0	0	3	1
2	Designing of next Generation Embedded Controllers	3	0	2	4	1
3	Communication System for CPS	3	0	2	4	1
4	Cyber Physical Systems Lab	0	0	4	3	1
5	Industrial Internet of Things	3	0	0	3	2
6	Next Generation Communication System	3	0	2	4	2
7	Professional Programming & Python	3	0	2	4	2
8	Advanced Communication Systems Lab	0	0	4	3	2

PROGRAMME ELECTIVE COURSES (PEC)

S.No	Course Title	Р	eriods per W	Credits	Semester	
3.1.13	Since Course Fine		Tutorial	Practical	G. Gales	
1	Control Systems for CPS	3	0	0	3	1
2	Virtual Instrumentation Systems	2	1	1	3	1
3	Security and Privacy of CPS	3	1	0	3	1
4	ASIC and FPGA Design	2	1	1	3	2

S.No	Course Title	P	eriods per V	/eek	Credits	Semester
		Lecture	Tutorial	Practical	0.00.00	
5	Al for CPS	2	0	2	3	2
6	Robotics & System Design	2	0	2	3	2
7	Machine Learning	3	0	0	3	2
8	E - Vehicle Technologies	2	1	1	3	2
9	Automotive Testing and Certification	3	0	0	3	2
10	Internet of Medical Things in Healthcare	2	0	2	3	3
11	Natural Language Processing	2	0	2	3	3
12	5G System Design	2	0	2	3	3

RESEARCH METHODOLOGY AND IPR COURSES (RMC)

S.No	No Course Title Periods per Week				Credits	Semester
5.110		Lecture	Tutorial	Practical	0.000	5055.5.
1	Research Methodology and IPR	2	0	0	2	1

OPEN ELECTIVE COURSES (OEC) (Out of Six Course - One Course need to be selected)

S.No	Course Title	Pe	eriods per \	Credits	Semester		
5.110	Course Title	Lecture	Tutorial	Practical	Credits		
1	Industrial Safety	3	0	0	3	3	
2	Business Data Analytics	3	0	0	3	3	
3	Operations Research	3	0	0	3	3	
4	Renewable Energy Resources	3	0	0	3	3	
5	Intellectual property and rights	3	0	0	3	3	
6	Cost Management of Engineering Projects	3	0	0	3	3	

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

S.No	Course Title	Р	eriods per W	Credits	Semester	
5.110		Lecture	Tutorial	Practical	Cicaics	
1	Technical Seminar	0	0	2	2	3
2	Certification Courses (LabVIEW)	0	0	2	1	3
3	Dissertation Phase I	0	0	12	6	3
4	Dissertation Phase II	0	0	24	12	4

AUDIT COURSES (AC) (Registration for any of these courses is optional to students)

S.No	Course Title	F	Periods per Week				
5	Course Title	Lecture	Tutorial	Practical			
1	English for Research Paper Writing	2	0	0			
2	Transport Management	2	0	0			
3	Sanskrit for Technical Knowledge	2	0	0			
4	Value Education	2	0	0			
5	Constitution of India	2	0	0			
6	Pedagogy Studies	2	0	0			
7	Stress Management by Yoga	2	0	0			
8	Personality Development through life -	2	0	0			
	Enlightenment Skills						
9	Unnat Bharat Abhiyan	2	0	0			

MBA in International Education Policy

International Education Policy (IEP) is full-time graduate program that prepares the next generation of leaders in international education reform. The many strengths of IEP include:

- Student-Led Learning Experiences IEP students create opportunities to deepen their knowledge of topics that interest them, through study groups, leadership of student organizations, leadership of topical conferences, or participation in numerous co-curricular programs.
- Cohort and Community During your time at NITTTR Chennai, you will have the opportunity to learn alongside a diverse group of peers who have a shared passion for education and an intellectual curiosity that will help transform the field. You will develop strong bonds and a supportive learning community through participation in various cohort and community-building, virtual activities hosted by your program, student organizations, and faculty and staff.
- World-Class Faculty IEP includes some of the top scholars and practitioners in their fields: education management, technology enabled teaching, development, literacy in developing countries, and more. These same world-class scholars will be your teachers, mentors, advisers, and connections to professional opportunities.

Programme Outcomes

The Programme "International Education Policy" will enable students to:

- create strategies to apply knowledge, skills, and abilities to collaboratively and equitably foster global well-being and resilience.
- Demonstrate knowledge of the trends of educational policy in country of origin and selected international contexts
- Identify and problematize issues of values in education policy and educational goals as these are formulated by governments and international organizations

- Identify important contemporary policy issues in country of origin and discuss their implications for schools and students
- Critically evaluate selected policy developments for educational institution and teachers' practice
- consolidate the expertise required to function as education policy facilitiator in various contexts within formal, informal and non-formal education sectors.

PEDAGOGICAL APPROACHES

There is a broad consensus that it requires a shift towards active, participative, and experiential learning methods that engage the learner and make a real difference to their understanding, thinking and ability to act. We've identified five pedagogic elements that cover a host of pedagogical approaches that might use to bring these elements into the learning environment.

- 1. **Critical reflection** including the more traditional lecture, but also newer approaches such as reflexive accounts, learning journals, and discussion groups.
- Systemic thinking and analysis the use of real-world case studies and critical
 incidents, project-based learning, stimulus activities, and the use of the campus as a
 learning resource.
- Participatory learning with emphasis on group or peer learning, developing dialogue, experiential learning, action research/learning to act, and developing case studies with local community groups and business
- 4. **Thinking creatively for future scenarios** by using role play, real-world inquiry, futures visioning, problem-based learning, and providing space for emergence.
- 5. **Collaborative learning** including contributions from guest speakers, work-based learning, interdisciplinary/ multidisciplinary working, and collaborative learning and coinquiry.

Ultimately it is the combination of *Preparation* + *experience* + *real-world engagement*.

The courses are clustered into four domains:

- 1. Education Leadership, Organizations and Entrepreneurship Cultivates the skills you need to become an effective, strategic and innovative leader
- 2. Education Policy and Analysis Provides you with a deep understanding of what works in education and how to leverage policy to generate solutions.
- 3. Human Development and Education Prepares you to offer learners the academic and socio-emotional supports that align with their individual needs.
- 4. Learning, Design and Technology Offers you the opportunity to create technological innovations and evolve the science of learning to improve student outcomes.

SI.	NAME OF THE PROGRAMME: MBA in INTERNATIONAL EDUCATION POLICY							
No.	Course Category		lits pe	r Semes	ter	Credits		
			II	III	IV	Total		
1	Foundation Course (FC)	3	0	0	0	3		
2	Programme Core Courses (PCC)	18	18	6	0	42		
3	Programme Elective Courses (PEC)	0	3	18	0	21		
4	Research Methodology and IPR Courses (RMC)	2	0	0	0	2		
5	Employability Enhancement Courses (EEC)		4	4	12	22		
	Total Credit	25	25	28	12	90		

FOUNDATION COURSES (FC)

S.No	Course Title	P	eriods per W	Credits	Semester	
3.113	=	Lecture	Tutorial	Practical	5.54.65	Semester
1	Statistics for Management	3	0	0	3	1

PROGRAMME CORE COURSES (PCC)

S.No	Course Title	Pe	eriods per \	Week	Credits	Semester
		Lecture	Tutorial	Practical		
1	Management Concepts and Organizational Behavior	3	0	0	3	1
2	Basic Education in Developing Countries	3	0	0	3	1
3	Human Resource Management	3	0	0	3	1
4	Information Management	3	0	0	3	1
5	Monitoring and Evaluation in International Educational Development (Globalization and Education)	3	0	0	3	1
6	Political Economy of Education and Development	3	0	0	3	1
7	Quantitative Techniques for Decision Making	3	0	0	3	2
8	Gender, Education, and Development	3	0	0	3	2
9	Financial Management	3	0	0	3	2
10	Sustainable Education and Ethics	3	0	0	3	2
11	Strategic Management	3	0	0	3	2
12	Disruptive Technologies in Education	3	0	0	3	2
13	International Business	3	0	0	3	3
14	Academic Social Responsibility (ASR)	3	0	0	3	3

PROGRAMME ELECTIVE COURSES (PEC)

S.No	Course Title	P	eriods per V	Credits	Semester	
			Tutorial	Practical	0.000	
1	Education for Global Peace	3	0	0	3	2
2	Legal Aspects of Business	3	1	0	3	2
3	Teacher and Teaching Quality	3	0	0	3	2

S.No	Course Title	Р	eriods per V	Veek	Credits	Semester
3.110	Course Title	Lecture	Tutorial	Practical	Credits	Semester
4	Reforming Higher Education: Learning from other countries	3	0	0	3	2
5	Negotiation and conflict management	3	0	0	3	2
6	Transforming Education Through Emerging Technologies	3	0	0	3	3
7	Educational Innovation and Social Entrepreneurship in Comparative Perspective	3	0	0	3	3
8	Curriculum and Pedagogy in International Contexts	3	0	0	3	3
9	Entrepreneurship in the Education Marketplace	3	0	0	3	3
10	Corporate Social Responsibility	3	0	0	3	3
11	Understanding Today's Educational Testing	3	0	0	3	3
12	Leadership, Entrepreneurship, and Learning	3	0	0	3	3
13	International Economics of Education	3	0	0	3	3
14	Innovation by Design: Projects in Educational Technology	3	0	0	3	3
15	Formative Evaluation for Educational Product Development	3	0	0	3	3
16	Academic Ranking Framework (Global and National)	3	0	0	3	3

RESEARCH METHODOLOGY AND IPR COURSES (RMC)

S.No	Periods per Week Course Title		Credits	Semester		
		Lecture	Tutorial	Practical		
1	Research Methodology and IPR	2	0	0	2	1

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

S.No	Course Title	Pe	eriods per \	Week	Credits	Semester
		Lecture	Tutorial	Practical		
1	Indian ethos and business ethics (Seminar)	0	0	2	1	1
2	Business Communications (Laboratory)	0	0	2	1	1
3	Data analysis and Business Modelling (Laboratory)	0	0	2	2	2
4	Rural Community Engagement	0	0	2	2	2
5	Creativity and Innovation Laboratory	0	0	4	2	3
6	Summer Internship	0	0	4	2	3
7	Dissertation	0	0	24	12	4
			To	otal Credits	22	

MBA in Educational Transformation

MBA in Educational Transformation degree program gives educators the foundation they need to lead significant initiatives in education policy to get meaningful results.

Programme Outcomes

To achieve this comprehensive goal/objective, the programme seeks to:

- Develop specialized knowledge and understanding about the philosophical and sociological bases of Engineering education;
- implement transformation process for transforming educational practices suiting the digital era.
- Make educational leaders competent to function effectively and manage and influence the faculty and academics.
- Identify and discuss the complex issues inherent in selecting a research problem in the educational domain, selecting an appropriate research design, and implementing a research project.
- Develop the skills and confidence of educators in the appropriate and effective use
 of digital technology to support learning and teaching.
- Motivate a person for entrepreneurial career and to make him capable of perceiving and exploiting successfully opportunities for enterprises.
- Apply the tools of AI in decision making, problem solving, perception, understanding human communication in the education scenario.
- o Apply analytical and creative thinking skills to real-life educational scenario.

CI.	NAME OF THE PROGRAMME: MBA in EDU	JCATIO	NAL TR	RANSFO	RMATI	NC
SI. No.	Course Category		lits pe	Credits Total		
			II	III	IV	
1.	Foundation Course (FC)	4	0	0	0	4
2.	Programme Core Courses (PCC)	18	24	0	0	42
3.	Programme Elective Courses (PEC)	0	0	18	0	18
4.	Research Methodology and IPR Courses (RMC)	0	0	2	0	2
5.	Employability Enhancement Courses (EEC)		2	2	12	18
	Total Credit	24	26	22	12	84

FOUNDATION COURSES (FC)

SI.	Course Title	Р	eriods per W	Credits	Semester	
No.		Lecture	Tutorial	Practical	Cicaics	Semester
1.	Business Statistics and Analysis	3	1	0	4	1

PROGRAMME CORE COURSES (PCC)

SI.	Course Title	Р	eriods per	Week	Credits	Semester
No.		Lecture	Tutorial	Practical	Credits	Semester
1.	Managerial Economics	3	1	0	4	1
2.	Indian Economy & Policy	3	1	0	4	1
3.	Business Communication	2	1	0	3	1
4.	Legal & Business Environment	2	1	0	3	1
5.	Indian Ethics and Business Ethics	3	1	0	4	2
6.	International Trade Laws	3	1	0	4	2
7.	Strategic Management	3	1	0	4	2
8.	Quantitative Techniques	3	1	0	4	2
9.	Organisation Behaviour	3	1	0	4	1
10.	Indian Financial System & Financial Markets	3	1	0	4	2

SI.	Course Title	Р	eriods per	Credits	Semester		
No.		Lecture	Tutorial	Practical	Credits		
11.	Financial Reports, Statements & Analysis	3	1	0	4	2	
12.	Innovation Technology Management	3	1	0	4	2	
13.	Managerial Skills for Effectiveness	3	1	0	4	2	

PROGRAMME ELECTIVE COURSES (PEC)

SI.	Course Title	Р	eriods per V	Veek	Credits	Semester
No.	Course Title	Lecture	Tutorial	Practical	Credits	Jemester
1.	History and Contemporary issues in Education	2	1	0	3	3
2.	Curriculum Studies	2	1	0	3	3
3.	Measurement and Evaluation in Education	2	1	0	3	3
4.	Transformative Learning	2	1	0	3	3
5.	Quality Assurance in Education	2	1	0	3	3
6.	Digital Transformation in Classrooms	2	1	0	3	3
7.	Al for Education	2	1	0	3	3
8.	Ranking and Accords	2	1	0	3	3
9.	Immersive Technologies for Engineering Education	2	1	0	3	3
10.	E-content Design and Development	2	1	0	3	3
11.	IPR	2	1	0	3	3
12.	History and Contemporary issues in Education	2	1	0	3	3
13.	Research Methodology in Education	2	1	0	3	3
14.	Educational Leadership	2	1	0	3	3
15.	Psychology of Learning & Instruction	2	1	0	3	3

RESEARCH METHODOLOGY AND IPR COURSES (RMC)

SI.	l. Course Title		eriods per W	Credits	Semester		
No.		Lecture	Tutorial	Practical	S. Cares	Jemester	
1.	Research Methodology and IPR	2	0	0	2	1	

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

SI.	Course Title	Р	eriods per W	Credits	Semester		
No.	No.		Lecture Tutorial Practical		Credits		
1	Technical Seminar	0	0	4	2	1	
2	Technical Seminar	0	0	4	2	2	
3	Summer Training	0	0	4	2	3	
4	Dissertation	0	0	24	12	4	
		18					

SEMESTER - I

Sl. No.	Course Title	Category	Contact Periods	L	Т	Р	Credits
1.	Managerial Economics	PC	4	3	1	0	4
2.	Indian Economy & Policy	PC	4	3	1	0	4
3.	Business Communication	PC	3	2	1	0	3
4.	Legal & Business Environment	PC	3	2	1	0	3
5.	Business Statistics and Analysis	FC	4	3	1	0	4
6.	Organisation Behaviour	PC	4	3	1	0	4
PRACTIC	ALS						
7.	Spoken and Written Communication	EEC	4	0	0	4	2
		Total	26	16	6	4	24

SEMESTER - II

SI. No.	Course Title	Category	Contact Periods	L	Т	Р	Credits		
1.	Indian Ethics and Business Ethics	PC	4	3	1	0	4		
2.	International Trade Laws Strategic Management	PC	4	3	1	0	4		
3.	Quantitative Techniques	PC	4	3	1	0	4		
4.	Indian Financial System & Financial Markets	PC	4	3	1	0	4		
5.	Innovation Technology Management	PC	4	3	1	0	4		
6.	Managerial Skills for Effectiveness	PC	4	3	1	0	4		
PRACTICALS									
7.	Data Analysis and Business Modelling	EEC	4	0	0	4	2		

SI. No.	Course Title	Category	Contact Periods	L	Т	Р	Credits
		Total	28	18	6	4	26

SEMESTER - III

SI. No.	Course Title	Category	Contact Periods	L	Т	Р	Credits
1.	Programme elective - 1	Е	3	2	1	0	3
2.	Programme elective - 2	E	3	2	1	0	3
3.	Programme elective - 3	E	3	2	1	0	3
4.	Programme elective - 4	E	3	2	1	0	3
5.	Programme elective - 5	Е	3	2	1	0	3
6.	Programme elective - 6	Е	3	2	1	0	3
7	Research Methodology and IPR Courses	RMC	4	2	0	0	2
PRAC	TICALS						
7.	Summer Training	EEC	4	0	0	4	2
		Total	26	13	7	2	22

SEMESTER - IV

SI. No.	Course Title	Category	Contact Periods	L	Т	Р	Credits
PRAC	FICALS						
1.	Dissertation	EEC	24	0	0	24	12
		Total	24	0	0	24	12

LIST OF ELECTIVES

SI. No.	Course Title	Category	Contact Periods	L	Т	Р	Credits
1.	History and Contemporary issues in Education	PE	3	2	1	0	3
2.	Curriculum Studies	PE	3	2	1	0	3

SI. No.	Course Title	Category	Contact Periods	L	Т	Р	Credits
3.	Measurement and Evaluation in Education	PE	3	2	1	0	3
4.	Transformative Learning	PE	3	2	1	0	3
5.	Quality Assurance in Education	PE	3	2	1	0	3
6.	Digital Transformation in Classrooms	PE	3	2	1	0	3
7.	Al for Education	PE	3	2	1	0	3
8.	Ranking and Accords	PE	3	2	1	0	3
9.	Immersive Technologies for Engineering Education	PE	3	2	1	0	3
10.	E-content Design and Development	PE	3	2	1	0	3
11.	IPR	PE	3	2	1	0	3
12.	History and Contemporary issues in Education	PE	3	2	1	0	3
13.	Research Methodology in Education	PE	3	2	1	0	3
14.	Educational Leadership	PE	3	2	1	0	3
15.	Psychology of Learning & Instruction	PE	3	2	1	0	3









தமிழ் நாடு तमिलनाडु TAMILNADU

UNDERTAKING

Sub: Movable and Immovable Assets - Usage

BZ-512757

S. KUMARAVELU

Stamp Vendor L.No.26/CH(S)/2010 Dt.02.03.2011 M-10/22, Iswarya Colony, Indira Nagar Adyar, Kottivakkam, Chennai - 600 02/

I PROF. Dr SUDHINDRA NATH PANDA, in the capacity of Member Secretary Board of Governors as well as Director of National Institute of Technical Teachers Training and Research, Taramani, Chennai - 600113 an autonomous organisation under Ministry of Education functioning from 1964 having extension centres at Bangalore, Hyderabad, Kalamassery (Kerala) and Vijayawada, hereby gives undertaking to the effect that all movable and immovable assets of this Institute shall be used only for the purpose of conducting academic activities, promotion of research and related administrative requirements of the Institution Deemed to be University.



DIRECTOR

निदेशक / DIRECTOR

राष्ट्रीय तकनीकी शिक्षक प्रशिक्षण एवं अनुसंघान संस्थान National Institute of Technical Teachers Training & Research भारत सरकार, शिक्षा मंत्रालय

M. SARAVANAN, B.Sc., Bl., Government of India, Ministry of Education ADVOCATE & NOTARY PUBLIC तरमणि, केन्ने-६००११३./Taramani, Chennai-600 113,

No.29, 2nd Cross Street, Sankar Nagar, Pammal, Chennai - 600 075. Cett: 984 108 1607



राष्ट्रीय तकनीकी शिक्षक प्रशिक्षण एवं अनुसंधान संस्थान NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH भारत सरकार, शिक्षा मंत्रालय[उच्चतर शिक्षा विभाग]

Government of India, Ministry of Education, [Department of Higher Education] तरमणि, चेन्नई - ६०० १९३, Taramani, Chennai - 600 113.

प्रो. डॉ. सुधींद्र नाथ पंडा Prof. Dr. SUDHINDRA NATH PANDA

निदेशक Director ANNEXURE-

TO WHOM IT MAY CONCERN

This is to undertake that the Institution shall not offer any programme(s) in the distance mode after its declaration as a deemed to be university.

(Sudhindra Nath Panda)

Director

Phone : +91-44-2254 2334 / 2254 5405

Fax : +91-44-2254 1126 Website : www.nitttrc.ac.in Director's Office: +91-44-2254 1982 / 2254 5406



राष्ट्रीय तकनीकी शिक्षक प्रशिक्षण एवं अनुसंधान संस्थान NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH भारत सरकार, शिक्षा मंत्रालय[उच्चतर शिक्षा विभाग]

Government of India, Ministry of Education, [Department of Higher Education] तरमणि, चेन्नई - ६०० १९३, Taramani, Chennai - 600 113.

प्रो. डॉ. सुधींद्र नाथ पंडा Prof. Dr. SUDHINDRA NATH PANDA

निदेशक Director ANNEXURE-

TO WHOM IT MAY CONCERN

This is to undertake that the Institution has not violated any of the provisions of any of the statutes / guidelines of any Statutory Authority in the period of five years preceding the date of submission of the application seeking status of an institution deemed to be university.

(Sudhindra Nath Panda)

Director

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Director

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Government of India, Ministry of Education, [Department of Higher Education] तरमणि, चेन्नई - ६०० १९३, Taramani, Chennai - 600 113.

प्रो. डॉ. सुधींद्र नाथ पंडा Prof. Dr. SUDHINDRA NATH PANDA निदेशक

ANNEXURE-

TO WHOM IT MAY CONCERN

This is to undertake that we have sufficient hostel accommodation for both boys and girls of all the year students in the proposed deemed to be university.

(Sudhindra Nath Panda)

Director

Director's Office: +91-44-2254 1982 / 2254 5406

E-mail : dir@nitttrc.ac.in / snpanda@nitttrc.ac.in

Phone : +91-44-2254 2334 / 2254 5405 Fax : +91-44-2254 1126



Director

राष्ट्रीय तकनीकी शिक्षक प्रशिक्षण एवं अनुसंधान संस्थान NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH भारत सरकार, शिक्षा मंत्रालय[उच्चतर शिक्षा विभाग]

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प्रो. डॉ. सुधींद्र नाथ पंडा Prof. Dr. SUDHINDRA NATH PANDA निदेशक

ANNEXURE-

TO WHOM IT MAY CONCERN

This is to undertake funding society / trust to the effect that on being declared as the Institution deemed to be university, the Institution(s) shall continue to receive the funds for maintenance and developmental expenditure, including the salary and non-salary increases in expenditure and the future expansion.

(Sudhindra Nath Panda)

Director

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Government of India, Ministry of Education, [Department of Higher Education] तरमणि, चेन्नई - ६०० १९३, Taramani, Chennai - 600 113.

प्रो. डॉ. सुधींद्र नाथ पंडा Prof. Dr. SUDHINDRA NATH PANDA

निदेशक Director ANNEXURE-

TO WHOM IT MAY CONCERN

This is to undertake that on being declared an Institution deemed to be university under the UGC Act, the institution(s) shall admit students to its approved academic programmes, under its enrolment, only from the academic session subsequent to be notification, for any reason whatsoever, in anticipation of the declaration as an institution deemed to be University or inclusion of the institution under the ambit of an institution deemed to be university, shall render the application invalid.

(Sudhindra Nath Panda)

Director

1/

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Director

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प्रो. डॉ. सुधींद्र नाथ पंडा Prof. Dr. SUDHINDRA NATH PANDA निदेशक

ANNEXURE-

TO WHOM IT MAY CONCERN

This is to undertake that the income and property of the institution, howsoever derived, shall be utilized only for the promotion of the objectives of the Institution including its growth and development. No portion of the income / property of the institution shall be paid or transferred, directly or indirectly by way of profit, to the persons who were / are members of the institution, provided that nothing herein contained shall present the payment in good faith or remuneration to any member thereof or to any other person in return for any service rendered to the institution or for travelling, halting and other similar charges, and all such expenditure shall be appropriately reflected in the accounts of the institution, maintained for the purpose.

(Sudhindra Nath Panda)

Director

4

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प्रो. डॉ. सुधींद्र नाथ पंडा Prof. Dr. SUDHINDRA NATH PANDA

निदेशक Director ANNEXURE-

TO WHOM IT MAY CONCERN

This is to undertake that the professional programmes already being conducted by it, if any, have the approval of the relevant Statutory / Regulatory bodies like AICTE, MCI, DCI, NCTE, BCI, IWC, etc. along with duly attested copy of the letter of approval granted to it by such bodies. In addition, each application shall be accompanied by an essentiality certificate from the State Government concerned, wherever necessary.

(Sudhindra Nath Panda)

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Government of India, Ministry of Education, [Department of Higher Education] तरमणि, चेन्नर्ड - ६०० ११3, Taramani, Chennai - 600 113.

प्रो. डॉ. सुधींद्र नाथ पंडा Prof. Dr. SUDHINDRA NATH PANDA निदेशक

ANNEXURE-

TO WHOM IT MAY CONCERN

This is to undertake that after declaration of the Institution a Deemed to be University, it shall not use the word "University suffixed to its name but may mention the words "deemed to be university" within parenthesis suffixed thereto.

(Sudhindra Nath Panda)

Director

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प्रो. डॉ. सुधींद्र नाथ पंडा Prof. Dr. SUDHINDRA NATH PANDA
TO WHOM IT MAY CONCERN

निदेशक Director

Sub: Registration certificate - Registered deed

I PROF. Dr SUDHINDRA NATH PANDA, in the capacity of Member Secretary Board of Governors as well as Director of National Institute of Technical Teachers Training and Research, Taramani, Chennai - 600113 an autonomous organisation under Ministry of Education functioning from 1964 having extension centres at Bengaluru, Hyderabad, Kalamassery (Kerala) and Vijayawada, hereby gives undertaking to the effect that the registration certificate as well as registered deed specifying that the Deemed to be University is exclusively for running educational activities and no other activities will be carried out and shall be used only for the purpose of conducting academic activities, promotion of research and related administrative requirements of the Deemed to be University within six months after the declaration of Deemed to be University

TINO DIRECTOR

Director's Office: +91-44-2254 1982 / 2254 5406

: dir@nitttrc.ac.in / snpanda@nitttrc.ac.in

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राष्ट्रीय तकनीकी शिक्षक प्रशिक्षण एवं अनुसंधान संस्थान NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH भारत सरकार, शिक्षा मंत्रालय[उच्चतर शिक्षा विभाग]

Government of India, Ministry of Education, [Department of Higher Education] तरमिण, चेन्नई - ६०० १९३, Taramani, Chennai - 600 113.

प्रो. डॉ. सुधींद्र नाथ पंडा Prof. Dr. SUDHINDRA NATH PANDA TO WHOM IT MAY CONCERN Director

Sub: Creation of Not – for – Profit society/Trust - Proposed Deemed to be University

I PROF. Dr SUDHINDRA NATH PANDA, in the capacity of Member Secretary Board of Governors as well as Director of this organization, National Institute of Technical Teachers Training and Research, Taramani, Chennai - 600113 an autonomous organisation under Ministry of Education functioning from 1964 having extension centres at Bangalore, Hyderabad, Kalamassery (Kerala) and Vijayawada , hereby gives undertaking to the effect that the Institution National Institute of Technical Teachers Training and Research Chennai will create a separate not-for-profit society/Trust in the name of Proposed Deemed to be University within six months after the declaration of the Deemed to be University.

Director's Office: +91-44-2254 1982 / 2254 5406

E-mail : dir@nitttrc.ac.in / snpanda@nitttrc.ac.in

Phone : +91-44-2254 2334 / 2254 5405 Fax : +91-44-2254 1126



राष्ट्रीय तकनीकी शिक्षक प्रशिक्षण एवं अनुसंधान संस्थान NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH भारत सरकार, शिक्षा मंत्रालय [उच्चतर शिक्षा विभाग]

Government of India, Ministry of Education, [Department of Higher Education] तरमणि, चेन्नई - ६०० ११३, Taramani, Chennai - 600 113.

प्रो. डॉ. सुधींद्र नाथ पंडा Prof. Dr. SUDHINDRA NATH PANDA

निदेशक Director

TO WHOM IT MAY CONCERN

Sub: Transfer of Movable and Immovable Assets

I PROF. Dr SUDHINDRA NATH PANDA, in the capacity of Member Secretary Board of Governors as well as Director of National Institute of Technical Teachers Training and Research, Taramani, Chennai - 600113 an autonomous organisation under Ministry of Education functioning from 1964 having extension centres at Bengaluru, Hyderabad, Kalamassery (Kerala) and Vijayawada, hereby gives undertaking to the effect that all movable and immovable assets of this Institute will be legally transferred in the name of the proposed Deemed to be University.

(SUDHINDRA NATH PANDA)

DIRECTOR

Director's Office: +91-44-2254 1982 / 2254 5406

: dir@nitttrc.ac.in / snpanda@nitttrc.ac.in

Phone : +91-44-2254 2334 / 2254 5405 : +91-44-2254 1126



Form No. II

(See Rule 8 Of the TamilNadu Societies Registration Rules, 1978)

CERTIFICATE OF REGISTRATION UNDER SECTION 10 OF THE TAMIL NADU SOCIETIES REGISTRATION

ACT, 1975 (TAMIL NADU ACT 27 OF 1975)

CERTIFICATE OF REGISTRATION OF SOCIETIES

SI. No.: 448 / 2003

I hereby Certify that

NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH

has this day been Registered Under The Tamil Nadu Societies Registration Act,1975 (Tamil Nadu Act 27 of 1975).

Given under my hand at CHENNAI SOUTH

this 10 th day of December 2003

Seal:

Station :

Signature of the Registrar

சங்கங்களின் பதிவாளம்

்தென்சென்னை

10:12

National Institute of Technical Teachers Training and Research [Ministry of Education, Government of India] Taramani, Chennai, Tamil Nadu 600113



For further details, contact

The Director

NITTTR Chennai

dir@nitttrc.ac.in / 044-2254 5406

www.nitttrc.ac.in