



M. Tech. AUGMENTED AND VIRTUAL REALITY

DEPARTMENT OF EDUCATIONAL MEDIA AND TECHNOLOGY

NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH

Institution Deemed to be University under Distinct Category, A Centrally Funded Technical Institute
Ministry of Education, Government of India, Taramani, Chennai - 600 113.

www.nitttrc.ac.in



NITTTR, CHENNAI

The National Institute of Technical Teachers' Training and Research, Chennai is a premier institution established in 1964 under the Ministry of Education, Government of India, dedicated to enhancing the quality of technical education in the country. It has been granted the "Institution Deemed to be University" status by the Ministry recently. This recognition acknowledges our 60 years of commitment to providing quality education and training, marking a significant milestone in our journey towards excellence in technical education and research.

Established to improve the standards of technical education, NITTTR offers a range of programs and services tailored to the needs of educators and institutions in the technical education sector. At the core of NITTTR's mission is the training and professional development of technical teachers. Through its various training programs, workshops, and courses, NITTTR equips educators with the necessary skills and knowledge to excel in their roles. These programs cover diverse topics such as curriculum development, teaching methodologies, educational technology, and quality assurance, ensuring that educators stay updated with the latest trends and practices in the field.

In addition to training, NITTTR also conducts research and consultancy activities aimed at improving the overall ecosystem of technical education. The institution engages in cutting-edge research to address key challenges and opportunities in the field, contributing to the advancement of knowledge and innovation. Moreover, NITTTR offers consultancy services to technical institutions seeking guidance on various aspects such as infrastructure development, curriculum design, and pedagogical practices.

NITTTR's commitment to excellence in technical education extends beyond its training and research initiatives. The institution actively promotes collaboration and networking among professionals in the technical education sector, fostering a community of practice where ideas and best practices are shared and exchanged. NITTTR plays a pivotal role in shaping the future of technical education in India. By providing high-quality training, conducting impactful research, and offering expert consultancy services, NITTTR continues to make significant contributions towards the enhancement of technical education standards and the development of a skilled workforce for the nation's growth and prosperity.





DEPARTMENT OF EDUCATIONAL MEDIA AND TECHNOLOGY

Educational media and technology hold paramount importance in modern educational paradigms, serving as transformative tools that enhance the learning experience and foster academic achievement. Educational media, such as videos, animations, and interactive simulations, captivates learners, making complex concepts more accessible. Technology, including e-learning platforms, digital resources, and collaborative tools, facilitates personalized and flexible learning environments, accommodating diverse learning styles.

The amalgamation of media and technology in education aims to create a holistic and innovative learning environment that meets the diverse needs of 21st-century learners. At the forefront of educational innovation, the Department of Educational Media and Technology is driving progress through its comprehensive training initiatives. These meticulously crafted programs are designed to equip educators with cutting-edge tools and methodologies, covering a diverse range of areas.

From the development of Multimedia Learning Resources and the creation of Interactive Learning Platforms to the design of impactful Online Courses, Massive Open Online Courses (MOOCs), and the production of engaging Videos and Podcasts, the department adopts a holistic approach to pedagogical enhancement. Specialized training extends to Adaptive Learning Environments, Gamification techniques, Digital Assessments, and the strategic integration of Social Media.

Looking forward, the department envisions itself as a leading center of excellence in Immersive Technologies, particularly in the creation of compelling content for Augmented Reality (AR) and Virtual Reality (VR).

M. Tech. AUGMENTED AND VIRTUAL REALITY

Augmented Reality (AR) and Virtual Reality (VR) are the emerging next generation platform for human digital interaction and these technologies stand at the forefront of transformative technologies. AR and VR are inherently interdisciplinary fields, combining elements of computer science, design, cognitive psychology, engineering and more.



The synergy of expertise from various disciplines contributes to the creation of more holistic, effective, and ethically conscious augmented and virtual experiences. This program provides students with a holistic understanding of these technologies, preparing them to collaborate across disciplines and approach challenges with a multifaceted perspective.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

- To establish a strong base in fundamental sciences, mathematics, and engineering principles, fostering comprehensive knowledge and proficiency.
- To nurture the capacity to grasp, interpret, and assess challenges in Immersive Technology while connecting them to real-world applications.
- To deliver extensive expertise for designing and creating novel products and innovative secure solutions to address real-world issues in the Interdisciplinary fields of Engineering, Medical and Healthcare, Education and Pedagogy.
- To instil self-confidence, cultivate a professional and ethical mindset, foster effective teamwork, nurture leadership qualities, enhance proficiency in soft skills, and develop the ability to connect engineering with social issues.

PROGRAMME OUTCOMES (POs)

- An ability to demonstrate the strong fundamentals in Graphics, AR and VR, Sensation and Perception, and Machine Learning.
- An ability to design interactive content for AR / VR experiences, design games AR/VR frameworks.
- An ability to develop research skills and methodologies for investigating and contributing to advancements in AR and VR.
- An ability to innovate and develop applications of AR/VR in the industry, medical, education, and other relevant fields.
- An ability to plan and manage technical projects, adherence to norms of professional ethics and exhibit high quality technical communication skills.
- The capability to innovate and contribute towards the development of next-generation AR/VR systems.
- An ability to amalgamate multi-disciplinary approaches in order to design, develop, implement, and assess solutions for a variety of real-world issues.



CORE COURSES

- Mathematical Foundations for Engineers - Probability and Statistics
- Introduction to Augmented Reality and Virtual Reality
- Sensation and Perception
- Mobile AR and VR
- Computer Graphics and 3D Modelling
- Programming for AR and VR
- Interaction and Experience Design for AR/VR
- Computer Vision
- Human Computer interaction in AR/VR
- Content Creation for VR/AR
- Introduction to Haptics

ELECTIVE COURSES

- Animation
- Machine Learning
- Web Technologies
- AR and VR applications in Industries
- Neural Image Synthesis for VR/AR
- Deep Learning
- Spatial Audio
- Cloud Computing
- UX for Extended Reality
- Game Development
- Data Visualization
- Entrepreneurship in AR/VR
- Design Thinking
- Immersive Sound and Audio design
- Object Oriented Programming
- Image Synthesis
- Psychophysics
- Spatial Computing
- 3D Shape Analysis
- Internet of Things
- Universal Design for Learning
- Assistive Technologies
- Asset Creation for VR/AR
- Python Programming
- Systems Engineering and Project Management



AREAS FOR SHORT-TERM TRAINING PROGRAMS

- Applications of Cloud Computing in Media and Internet
- Bibliometric Analysis and Reference Management
- Cloud Computing for Media and OTT platforms
- Content Development for AR and VR
- Cyber security awareness for handling Social Media Vulnerabilities
- Data Analytics for Multimedia Applications
- Data Analytics with Python for Media Applications
- Developing Instructional Material
- Digital Competencies for developing and managing digital libraries
- Digital Literacy and Technology Competency
- Digital Pedagogy and Online Tools
- Digital Tools for Education
- E-Content Development and LMS
- Educational Video Production workshop for Civil and Allied Branches
- Educational Video Production workshop for Mechanical and Allied Branches
- Emerging Trends in Digital Learning Environments
- Game Development using Unreal Engine
- ICT for Teaching and Learning
- Immersive Technologies – AR and VR
- Infographics and Digital Storytelling
- Innovative Approaches in Teaching and Learning
- Innovative Use of Educational Media and Technology
- Instructional Design for Online Courses
- Interactive e-Learning Module for Teacher Training
- Learning Technologies
- Leveraging Contemporary Educational Tools for Engagement
- Open Educational Research (OER) and Social Media Analytics
- Optimizing Online Publishing with LaTeX Techniques
- Outcome based learning and teaching
- Python Framework for Game Development
- Utilizing R for Data Analysis and Insight Discovery
- Video-based Collaborative Learning

FACILITIES OF DEPARTMENT OF EDUCATIONAL MEDIA AND TECHNOLOGY



XR LAB



**Extended Learning
Technology Centre - XLTC**



ETV Studio



Microteaching Lab



THE DIRECTOR

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