



# NITT

NATIONAL INSTITUTE OF TECHNOLOGY  
TIRUCHIRAPPALLI (DEEMED UNIVERSITY)  
(FORMERLY REGIONAL ENGINEERING COLLEGE  
TIRUCHIRAPPALLI)



# R&D ACTIVITIES AT National Institute of Technology TIRUCHIRAPPALLI

# ENGINEERING STREAMS

Architecture

Civil Engineering

Mechanical Engineering

Metallurgical Engineering

Electrical and Electronics Engineering

Electronics and Communication Engg

Chemical Engineering

Computer Science and Engineering

Production Engineering

Instrumentation and Control Engineering

# Faculty

- Faculty Strength : 240

(Which includes Director, Professors, Assistant Professors, Lecturers, Librarians and Physical Director)

(TO BE EXTENDED TO 300)

**Number of Ph.D. Degree Holders : 110**

**Alumini of IITs / IISC : 50**

# Number of Ph.D.s Completed in last five Years

Department	Number
Civil Engineering	1
Chemical Engineering	2
Chemistry	8
Mechanical Engineering	2
Electrical and Electronic Engineering	3
Metallurgical and materials Engineering	4
Mathematics	2
Production Engineering	6

# NATIONAL BOARD OF ACCREDITATION (NBA)

<b>Sl. NO.</b>	<b>Name of Programme (s)</b>	<b>Accreditation Status</b>	<b>Period of validity w.e.f.12.01.2005</b>
1	B.E. in Civil Engg.	Accredited	3 years
2	B.E. in Computer Science & Engg.	Accredited	3 years
3	B.E. in Electrical & Electronics Engg.	Accredited	3 years
4	B.E. in Electronics & Comm. Engg.	Accredited	3 years
5	B.Tech in Chemical Engg.	Accredited	3 years
6	B.E. in Metallurgical Engg.	Accredited	3 years
7	B.E. in Production Engg.	Accredited	3 years

# MAJOR RESEARCH AREAS

## ARCHITECTURE

- Architectural acoustics
- Energy audit of buildings
- Design of energy efficient buildings
- Infra red thermal imaging of buildings

# MAJOR RESEARCH AREAS.....

## CHEMICAL ENGINEERING

- Separations Technology
- Process control
- Process Simulation
- Heat transfer
- Energy and Environmental Engg

# MAJOR RESEARCH AREAS.....

## CIVIL ENGINEERING

- High strength and high performance concrete
- Alternate building materials and composites
- Transportation engineering
- ITS / GIS / GPS
- Water resources engineering
- Environmental engineering
- Geotechnical engineering

# MAJOR RESEARCH AREAS.....

## COMPUTER SCIENCE & ENGINEERING

- Computer architecture
- Processor design
- Parallel architecture for VLSI
- Wireless network security
- Grid computing algorithms
- Data mining and warehousing
- Pattern recognition

# MAJOR RESEARCH AREAS.....

## ELECTRICAL & ELECTRONICS ENGINEERING

- FACTS controllers
- Autonomous power plants
- Wind – Solar integrated systems
- Development of electrical generators and power electronic controllers for renewable energy systems.
- Energy efficient induction motors

# MAJOR RESEARCH AREAS.....

## ELECTRONICS & COMMUNICATION ENGINEERING

- FPGA based VLSI system design
- Adhoc networks
- Non-linear optics
- Microwave integrated circuits
- Fibre optic communication
- Artificial neural networks
- Coding theory
- Array processing

# MAJOR RESEARCH AREAS.....

## INSTRUMENTATION & CONTROL ENGINEERING

- Measurement systems for mechanical quantities
- Biomedical instrumentation
- Neural network and fuzzy logic based intelligent controllers
- Microcontroller based measurement and control systems
- Design of process loops

# MAJOR RESEARCH AREAS.....

## MECHANICAL ENGINEERING

- Automobile engineering
- Heat & mass transfer
- Computational fluid dynamics
- Non-conventional energy sources

# MAJOR RESEARCH AREAS.....

## METALLURGICAL & MATERIALS ENGINEERING

- Mechanical alloying
- Welding engineering & welding metallurgy
- Process metallurgy
- Surface engineering
- Corrosion and corrosion engineering

# MAJOR RESEARCH AREAS.....

## PRODUCTION ENGINEERING

- Industrial engineering
- Sheet metal forming
- Non-conventional machining
- Robotics
- Metal joining & simulation

# MAJOR RESEARCH AREAS.....

## MATHEMATICS AND COMPUTER APPLICATIONS

- Net working
- Theoretical computer science
- Algorithms
- Image processing and tracking
- Graph theory
- e-learning
- Data mining and warehousing

# MAJOR RESEARCH AREAS.....

## MANAGEMENT STUDIES

- Finance management
- Information systems
- Human resources management
- Marketing management
- Production management

# MAJOR RESEARCH AREAS.....

## PHYSICS

- X-ray crystallography
- Molecular modeling for novel drug design
- Laser material processing
- Laser & fiber optics

# MAJOR RESEARCH AREAS.....

## CHEMISTRY

- Phytochemical & Pharmacological
- Adsorption kinetics
- Biochemistry
- Electro Chemical Studies
- Liquid Crystals
- Dye Sensitized solar cell
- Metal – Air high energy fuel cell
- Coordination Chemistry

# MAJOR RESEARCH FACILITIES AVAILABLE

## ARCHITECTURE

- Infrared thermal imaging system
- Thermal comfort data logger
- Data logger for type-t thermocouples
- Thermo – hygrometer
- Data logger for lux levels
- Hot – wire anemometer

# MAJOR RESEARCH FACILITIES AVAILABLE.....

## CHEMICAL ENGINEERING

- UV spectrophotometer
- Gas chromatograph
- Porosimeter
- d-space
- Laminar flow chamber,
- Fermentor with controllers
- Software like HYSYS, FLUENT etc

# MAJOR RESEARCH FACILITIES AVAILABLE.....

## CIVIL ENGINEERING

- Universal testing machines of capacity of 40t and 100t
- Compression testing machines of capacity 2000 kN and 3000 kN
- Ultrasonic pulse concrete tester
- Water permeation equipment for concrete
- Corrosion detection equipment for reinforcement
- 10m x 10m heavy testing floor
- Non-destructive testing equipment
- Traffic data acquisition system
- Handheld GPS devices
- Vehicle emission testing
- Computerised Triaxial Testing machine
- Software for analysis and design

# MAJOR RESEARCH FACILITIES AVAILABLE.....

## ELECTRICAL AND ELECTRONICS ENGINEERING

- Development of STATCOM, SSSC, UPFC.
- Grid connected P – V systems and Controllers.
- Controlled rectifiers with micro – controller based firing schemes.
- Self – Excited Induction Generator Systems for wind driven applications.
- Fabrication and installation Induction motors with micro – controller based stator connection switching facility.

# MAJOR RESEARCH FACILITIES AVAILABLE.....

## ELECTRONICS AND COMMUNICATION ENGINEERING

- Vector Network analyzer
- VLSI CAD tool
- MIC CAD tool
- Photonics CAD tools
- Embedded software tool

# MAJOR RESEARCH FACILITIES AVAILABLE.....

## INSTRUMENTATION AND CONTROL ENGINEERING

State of the art equipments are available in  
the following laboratories

- Instrumentation laboratory
- Transducer & Measurement laboratory
- Process control laboratory
- Micro control laboratory
- Biomedical laboratory

# MAJOR RESEARCH FACILITIES AVAILABLE.....

## METALLURGICAL AND MATERIALS ENGINEERING

State of the art equipments are available in  
the following laboratories

- Metallogrphy laboratory
- Corrosion laboratory
- Powder metallurgy laboratory
- Welding and foundry laboratory

# MAJOR RESEARCH FACILITIES AVAILABLE.....

## MECHANICAL ENGINEERING

- Electro magnetic vibration exciter
- Portable vibration data analyzer with FFT
- Computational testing of electrode drying ovens
- Co-ordinate Measuring Machine
- Optical Projector
- Gear Rolling Tester
- Optical Flatness Tester
- Vernier Gauges
- Slip Gauges

# MAJOR RESEARCH FACILITIES AVAILABLE.....

## PRODUCTION ENGINEERING

- ❖ Power press (200 tonnes) – BEMCO
- ❖ Centreless Grinding machine
- ❖ Universal Tool and Cutter Grinder
- ❖ EDM
- ❖ Gear Hobbing machine
- ❖ Lathe – 16 nos.
- ❖ Planing machine – 1 no.
- ❖ Milling machines – 4 nos.
- ❖ Drilling machines – 3 nos.
- ❖ Shaping machines – 3 nos.
- ❖ Surface Grinding machine
- ❖ EMCO PC Turn 55 – 2 nos
- ❖ EMCO PC Mill 55 – 2 nos
- ❖ TRIAC-3-axis Milling machine
- ❖ EMCO COMPACT - CNC Trainers – 2nos
- ❖ Rhino X-3 Robot work cell
- ❖ AGV training system

# MAJOR RESEARCH FACILITIES AVAILABLE.....

## PHYSICS

- X-ray generator for Radiographic Testing
- Ultrasonic Flaw Detectors
- Eddy current instrument
- Holographic Non-Destructive Testing
- Helium-Neon Laser systems
- Infrastructure for Measuring Physical Parameters
- Image Processing System
- Holography
- Adaptive Optics

# MAJOR RESEARCH FACILITIES AVAILABLE.....

## CHEMISTRY

- **UV-VIS Spectrophotometer (JASCO UVIDEC-430B)**
- **IR Spectrophotometer (Perkin Elmer-1437)**
- **Simultaneous TG-DTA Thermal Analyser (Shimadzu DT-40)**
- **HPLC (Shimadzu LC-10 AT)**
- **AAS (GBC-902)**
- **Graphite Furnace (GF-2000)**
- **Photometer (YSI-9100)**
- **Gouy Magnetic Balance**
- **Polarograph (Elico)**
- **Karl Fisher Titrimeter (Lasco)**

# CENTRAL LIBRARY

Books	1 lakh
Back Volumes	16312
<b><i>BIS (I.S.)</i></b>	11900
Reports	7890
Journals Subscribed	420
Video Cassettes	1550
Compact Discs	185
Floppy Disc/Software	150
Audio Cassettes	51

# COMPUTER SUPPORT GROUP

## The Octagon – Round the Clock Service

- Data centre for the RECLAN
- Resources centre to supplement classrooms with labs
- Introduce the students to latest technologies
- Providing technical Support to Departments in Information Technology
- Maintenance of systems and Network in NITT
- Continuing education & Consultancy services

# Projects

- Major sponsoring agencies are MHRD, DST, ISRO, etc.
  - Currently 25 projects worth Rs. 3.14 crores
- Research publications in journals/conferences
  - More than 200 this year

# MOUs Signed

- BHEL
- FLSMIDTH
- BHARTI FOUNDATION
- IBM
- BDU
- NIMS, Japan
- GCE, Salem
- TCS

# Projects funded by MHRD in the last three years

Sl. No.	Department	Schemes	Amount in lakhs
1	Architecture	R&D	15.0
2	Chemical	R&D	20.0
3	Civil	Thrust area	25.0
4	ICE	Thrust area, R&D	20.0
5	EEE	R&D	6.0
6	Mechanical	R&D	6.0
7	Production	Thrust area	8.0

# Technical Education Quality Improvement Programme

<b>Category of Expenditure</b>	<b>Total Allotment (Rs. Million)</b>
<b>ACADEMIC EXCELLENCE</b>	<b>194.18</b>
<b>NETWORKING OF INSTITUTIONS</b>	<b>4.88</b>
<b>SERVICES TO COMMUNITY AND ECONOMY</b>	<b>9.94</b>
<b>TOTAL</b>	<b>209.00</b>