17
18

वार्षिक प्रतिवेदन / Annual Report

भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

भारतीय प्रौद्योगिकी संस्थान तिरूपति

Indian Institute of Technology Tirupati

वार्षिक प्रतिवेदन
Annual Report
2017-18

भारतीय प्रौद्योगिकी संस्थान तिरूपति
Indian Institute of Technology Tirupati

Contents

Director's Report

The year 2017-18 witnessed remarkable growth of the Institute in terms of infrastructure development, faculty/staff recruitment, start of new academic programmes, and research initiatives. The MS (by research) and PhD programmes in the areas of Civil Engineering, Computer Science and Engineering, Electrical Engineering, and Mechanical Engineering, including sciences and humanities were launched. The process for admitting students to B.Tech in Chemical Engineering, and M.Tech in Computer Science and Engineering, Electrical Engineering, and Mechanical Engineering was initiated. The Institute had the highest percentage of female student enrolment (17%) in the B. Tech programme, among all the IITs for the third year running.

The foregone year was remarkable for the Institute for various reasons. The Institute conducted its first round of recruitment for regular positions, and made 44 faculty offers to highly qualified and experienced candidates. The total faculty strength, including five senior professors re-employed on superannuation from IIT Madras and IIT Kanpur, and full time visiting faculty members, reached 45. This recruitment proved to be a major step towards the self-sufficiency of the Institute in terms of teaching, as it substantially lessened the number of guest faculty members from the mentoring and other institutes. The tests and interviews for appointing permanent non-teaching staff members were also held to get the stronger team of supporting staff for the smooth functioning of the Institute. The Institute initiated the process for the second round of faculty and staff recruitment.

The Institute organised and hosted various academic events such as Faculty Development Programme, workshop on Functional Analysis, 7th Topical Conference of the ISAMP, alongwith number of invited lectures/talks by eminent academicians and researchers from across the globe. Further, the past year witnessed the celebrations of 2nd Institute Day, a run for unity, the first performance of SPICMACAY, Yoga Day celebrations, Digital India Awareness Programme etc. The first ever techno-cultural fest organised by the students of IIT Tirupati—Tirutsava, encompassing various technical and cultural events, special lectures, and workshops, was held in the month of March 2018. The student activities also increased with the events organised to support the various national schemes like Vigilance Awareness Week, Ek Bharat Shreshth Bharat, and NSS.

IIT Tirupati has been keen on creating sufficient academic infrastructure to meet the requirements and expectations of the students since its inception. The increase in number of faculty, staff and students created an expected space crunch. To address this requirement, the Institute hired an adjacent building to the existing temporary campus building to house faculty offices and research scholars' cabinets. The students who joined B.Tech programme in August 2017 were housed in the IISER Tirupati campus.

The construction of the transit campus, in the permanent campus site, to cater to the immediate requirement of providing laboratory facilities for teaching and research, and hostels for students was in full swing to be ready in time for the 2018-19 academic year. Many green and sustainable features along with the fast construction technologies have been adopted in the construction of the transit campus. The master plan for a 12,000-student Institute in a 530 acres campus has been completed. The design of various academic buildings, residential buildings and facilities to be constructed in next two years is in progress.

On behalf of IIT Tirupati fraternity, I wish to thank the members of the Board of Governors and staff of the Technical Section of the MHRD for their guidance and continued support. We thank the Government of Andhra Pradesh, for the support extended in resolving issues related to land allotted to the Institute and substantially completing the construction of the compound wall around the campus site. I, also, extend my thanks to our mentor Institute for its unswerving support in the smooth functioning of the Institute.

Prof. K. N. Satyanarayana
Director

1. Introduction

The establishment of Indian Institute of Technology Tirupati (IITT) was announced in 2014 by the Government of India along with five other new IITs at Palakkad, Jammu, Bhilai, Goa, and Dharwad (announced in 2015). IIT Tirupati launched its academic programme with the support of its mentor Institute, IIT Madras, on August 5, 2015 from a temporary campus situated in Tirupati. Consequent upon the approval of the President of India to The Institutes of Technology (Amendment) Act, 2016 of Parliament on August 09, 2016, and its subsequent publication in *The Gazette of India*, *Extraordinary, Part-II* on August 10, 2016, IIT Tirupati was accorded the status of Institute of National Importance. Presently, operating from its Temporary Campus situated on Tirupati-Renigunta Road in the premises of Krishna Theja Group of Institutions, IIT Tirupati, in the third year itself of its operations, is set to start its operations from the 530 acres Permanent Campus located in Merlapaka Village on Yerpedu-Venkatagiri Highway.

Subsequent to the appointment of the Director in January 2017, the process of recruitment of the regular faculty members commenced, and 33 faculty members from various parts of the country joined the Institute. In January 2018, another round of recruitment began with the release of the advertisement. The Institute expects its faculty strength to reach 70 by the end of 2018. The Institute also initiated the procurement of equipment for the undergraduate laboratories to provide hands-on experience to its students. To promote collaborative academic and research activities, the Institute signed MoUs with number of universities, and research laboratories of international repute that further aims at exchange visits of faculty, students, and research staff, joint academic events, and student internships. During the year 2017-18, IIT Tirupati celebrated its second Institute Day with Prof. V. S. Raju (Former Director IIT Delhi) as the Chief Guest of the event. Various invited talks by the eminent scholars were hosted by the Institute for the benefits of the faculty and students. In collaboration with IISER Tirupati, the Institute hosted 7th Topical Conference of the ISAMP. Prof. Rajeev Sanghal, Director, IIT BHU, inaugurated the Faculty Development Programme organised by IIT Tirupati in the month of December 2017. The sessions were conducted by Prof. Pradeep K. Ramancharla, IIIT Hyderabad. Along with IIT Tirupati faculty members, the participants were from the IITs at Palakkad, Goa, Bhilai, Dharwad, IISER Tirupati, NIT Surathkal, and some other technical Universities. Mathematics department of the Institute organised a workshop on 'Functional Analysis'. The first edition of IIT Tirupati techno-cultural fest – Tirutsava was organised in the month of March. The Institute succeeded in securing the internship opportunities to 100% of its students.

In the academic year 2017-18, IIT Tirupati admitted 114 students to B. Tech programme in the branches of Civil Engineering, Computer Science and Engineering, Electrical Engineering, and Mechanical Engineering. A total of 14 students joined MS (Research) in the aforementioned branches of engineering. Further, the Institute started admitting students to its PhD programme from this academic year, and admitted 14

research scholars in all the above cited disciplines of engineering along with Physics, Chemistry, Mathematics, Economics, and English. Admissions to B. Tech in Chemical Engineering, and M. Tech in Computer Science and Engineering, Electrical Engineering, and Mechanical Engineering are going to be offered from the ensuing academic session.

Along with strengthening its research and academic front, the Institute has continuously been involved in building its transit campus in permanent campus site to cater to the immediate needs of laboratory facilities, classrooms, and student accommodation. The Transit Campus of the Institute is located in the South-East corner of the permanent campus site in an area of about 30 acres that eventually will be integrated in the master plan of the permanent campus. The construction of the transit campus was entrusted as a deposit work to CPWD. The transit campus is being built adopting fast track and sustainable construction technologies like Glass Fibre Reinforced Technology and Pre-engineered building.

A duly constituted Campus Master Plan Advisory Committee appointed the consultants for the campus master plan, design of academic zone buildings and design of external services in September 2017 and for the design of residential zone buildings and sports facilities in March 2018. The Master Plan for the 12,000-student campus has been completed. The construction of the campus to cater to the needs of 1,200 students and 120 faculty members by year 2020, and for 2,500 students and 250 faculty members is going to begin soon. Further details on the development of the campuses of the Institute can be found in the 9th section of this report under the head, 'Campus Infrastructure'.

2. Organisation

IITs are autonomous statutory institutions of national importance for higher education and research in engineering, science and technology. There are 23 such Institutes of distinction across the country today. IIT Tirupati (IITT) is one of these. Situated in the temple town of Tirupati, IITT aspires to be leading institute in imparting technical education that serves humanity to the highest level. The academic policies of the Institute are decided by the Senate, while, for the overall administration and governance, the 'Board of Governors' is responsible. Various affairs related to finance are administered and counselled by the Finance Committee, and Building and Works Committee advises the Institute on the matters related to construction of all major capital works. This chapter of the report details about the organisational structure of the Institute with the names of the persons involved. The chapter, further, apprises about the faculty and staff members of the Institute.

2.1 Governance

Board of Governors

Chairman	**Shri K. K. Sharma,** IAS, Govt. of India (Till February 28, 2018) Secretary, Department of Higher Education, MHRD
	Shri R. Subrahmanyam, IAS, Govt. of India (From March 01, 2018 till date) Secretary, Department of Higher Education, MHRD
Members	**Prof. Bhaskar Ramamurthi,** Director, IIT Madras
	Prof. K. N. Satyanarayana, Director, IIT Tirupati
	Shri S. S. Sandhu, IAS, Add. Secretary (TE), MHRD
	Smt Darshana Momaya Dabral, Jt. Sec & FA, MHRD
	Shri Prashant Agrawal, Director (IITs), MHRD
Member Secretary	**Shri Aditya Nath Das** (From January 22, 2017 till date) Secretary, Department of Higher Education, Govt. of A.P.

Finance Committee

Chairman	**Chairman,** Board of Governors
Members	**Director,** IIT Tirupati
	Add. Secretary (TE), MHRD or his/her representative
	Joint Secretary & FA, MHRD or his/her representative
	Dean, Planning & Infrastructure, IIT Tirupati
	Prof. David Koilpillai, IIT Madras
	Member Secretary, Registrar, IIT Tirupati

Senate

Chairman	**Director,** IIT Tirupati
Secretary	**Registrar,** IIT Tirupati
Members	**All Deans, Professors of the Institute**
Three Educationists of Repute and not Employees of the Institute	**Prof. G. Venkataratnam,** Department of Mechanical Enggineering, IIT Madras
	Prof. C. Vijayan, Department of Physics, IIT Madras
	Prof. D. Malathy, Department of Humanities and Social Sciences, IIT Madras
Persons from Industry, R&D	**Mr. Gala Vijaya Naidu,** CEO, Mangal Industries Limited, Tirupati
	Dr. T. V. C. Sarma, Scientist/Engineer-SG, National Atmospheric Research Laboratory, ISRO, Gadanki, A. P.
Programme Coordinators	**Dr. Abhijit Ganguli,** Civil Engineering
	Dr. Venkata Ramana Badarla, Computer Science and Engineering
	Dr. Rama Krishna Sai Gorthi, Electrical Engineering
	Dr. V. Vamshi Krishna Reddy, Humanities & Social Sciences
	Dr. Durga Prasad Challa, Mathematics
	Dr. Anil Kumar Emadabathuni, Mechanical Engineering
	Dr. Koteswara Rao Bommisetty, Sciences
Faculty Members from the Institute	**Dr. Arun Kumar Manna,** Assistant Professor, Chemistry
	Dr. Prasanna V. Sampath, Assistant Professor, Civil Engineering

	Dr. S. Rajesh, Assistant Professor, Mathematics
	Dr. Subramanyam Gorthi, Assistant Professor, Electrical Engineering
	Dr. Chandra Sekhar Bahinipati, Assistant Professor, Humanities & Social Sciences
Student Members from the Institute	**Tapan Ganatma Nakkina,** General Secretary
	Pranjal Shukla, Academic Affairs Secretary
	C. Kishore Kumar, Research Affairs Secretary
Warden Member	**Dr. Prashanth Vooka,** Assistant Professor, Electrical Engineering
Deputy Librarian/ Assistant Librarian	**Ex-officio**

Building and Works Committee

Chairman	**Director,** IIT Tirupati
Members	**Shri Santhosh Rao,** CGM, APSPDCL, Tirupati
	Shri C. N. Suresh, Superintending Engineer, CPWD
	Chairman, Engineering Unit, IIT Madras
	Shri S. Ramanujam, Rtd. Director, DCSEN, DAE, Mumbai
Non-Member Secretary	**Shri P. P. Chowdhary,** Sr. Project Advisor (Const.), IIT Tirupati

2.2 Faculty Profile

IIT Tirupati completed its first round of recruitment for the various departments in May 2016, and made 44 offers against the posts of assistant and associate professors. Also, five retired senior Professors from IIT Kanpur and IIT Madras, who were re-employed with the approval of the Visitor, continue to serve IIT Tirupati. In addition to this, some senior faculty members currently working /recently retired from IIT Madras are also continuing to engage in instructing B.Tech students at IIT Tirupati. Further, to strengthen the Institute, second round of faculty selection was initiated vide Advertisement No IITT/FAC-RMT-02/2018 dated 10/01/2018.

Chemistry

Faculty Members

Dr. Arun Kumar Manna
Assistant Professor

Dr. Debashis Mandal
Assistant Professor

Dr. Rajib Kumar Biswas
Assistant Professor

Civil Engineering

Faculty Members

Dr. K. N. Satyanarayana
Professor

Dr. Abhijit Ganguly
Associate Professor

Dr. B. Krishna Prapoorna
Associate Professor

Dr. M. Nithyadharan
Assistant Professor

Dr. Prasanna V. Sampath
Assistant Professor

Dr. Shihabudheen M. M.
Assistant Professor

Dr. B. Janaki Ramaiah
Visiting Faculty

Dr. B. Radhika
INSPIRE Faculty

Guest Faculty Members

Dr. J. Karthekeyan
Professor
S. V. University Engineering College

Dr. Kalaiselvi
Professor
Rajalakshmi Engineering College

Dr. Manu Santhanam
Professor
IIT Madras

Computer Science and Engineering

Faculty Members

Dr. Venkata Ramana B.
Associate Professor

Dr. G. RamaKrishna
Assistant Professor

Dr. Kalidas Yeturu
Assistant Professor

Dr. V. Mahendran
Assistant Professor

Dr. G. Ravi Prakash Iyer
Visiting Faculty

Dr. Sridhar Chimalakonda
Visiting Faculty

Guest Faculty Member

Dr. C. Pandu Rangan
Professor
IIT Madras

Electrical Engineering

Faculty Members

Dr. Rama Krishna Sai Gorthi
Associate Professor

Dr. K. P. Naveen
Assistant Professor

Dr. N. N. Murty
Assistant Professor

Dr. Prasanth Vooka
Assistant Professor

Guest Faculty Members

Dr. Sai Krishna P. S.
Assistant Professor

Dr. Subrahmanyam Gorthi
Assistant Professor

Dr. Bijoy Krishna Das
Professor
IIT Madras

Dr. R. Sundar
Professor & Dean
Rajalakshmi Engineering College

Humanities and Social Sciences

Faculty Members

Dr. A. Raghuramaraju
Professor

Dr. Chandra Sekhar Bahinipati
Assistant Professor

Dr. Prabha Shankar Dwivedi
Assistant Professor

Dr. Rahul A. Sirohi
Assistant Professor

Dr. V. Vamshi Krishna Reddy
Assistant Professor

Guest Faculty Members

Dr. Sabuj Kumar Mandal
Assistant Professor
IIT Madras

Dr. Vedaparayana
Professor Emeritus
S. V. University

Dr. Srikanth Reddy
Professor
S. V. University

Dr. M. H. Rao
Professor
S. V. University

Mathematics

Faculty Members

Dr. V. Raghavendra
Professor

Dr. Durga Prasad Challa
Assistant Professor

Dr. Ishapathik Das
Assistant Professor

Dr. S. Rajesh
Assistant Professor

Dr. Srijanani Anurag Prasad
Assistant Professor

Guest Faculty Members

Dr. G. Ravindran
Associate Professor
ISI Chennai

Dr. S. G. Kamath
Retired Professor
IIT Madras

Mechanical Engineering

Faculty Members

Dr. N. N. Kishore
Professor

Dr. Anil Kumar E.
Associate Professor

Dr. N. Venkaiah
Associate Professor

Dr. D. V. Kiran
Assistant Professor

Dr. Madan Mohan Avulapati
Assistant Professor

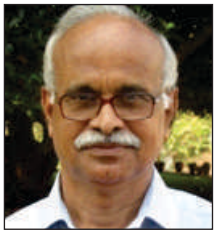
Dr. P. Venkataramana
Assistant Professor

Dr. Sriram Sundar
Assistant Professor

Guest Faculty Members

Dr. K. L. Narayana
Formerly Professor & Principal
S. V. University College of Engg

Dr. K. Ramamurthi
Retired Professor
IIT Madras



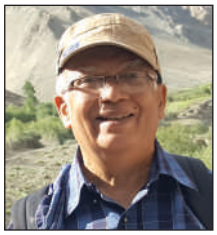
Dr. Kumaraswamy S.
Retired Professor
IIT Madras

Dr. Prasad Patnaik B. S .V.
Professor
IIT Madras

Dr. Somashekhar S. H.
Associate Professor
IIT Madras

Physics

Faculty Members



Dr. P. C. Deshmukh
Professor

Dr. T. S. Natarajan
Professor

Dr. B. Koteswar Rao
Assistant Professor

Dr. Rudra Sekhar Manna
Assistant Professor

Life Sciences

Guest Faculty Member

Dr. Mousumi Banerjee
Life Sciences

Ecology and Environment

Guest Faculty Members

Dr. Nandini Rajamani
Assistant Professor
IISER Tirupati

Dr. Robin V.
Assistant Professor
IISER Tirupati

2.3 Academic and Non-Academic Staff

Academic Staff

IIT Tirupati completed its first round of recruitment for academic staff in the month of July 2017. Along with regular, some staff members on ad hoc were also engaged to assist the faculty members in regular course work and conduct of experiments in laboratories effectively. The department-wise list of the academic staff is given below:

Chemistry

Dr. M. Jagadish
Senior Project Officer

Dr. Sanyasinaidu G.
Junior Technical Superintendent

Computer Sci & Engg

Mrs. J. Suja
Project Officer

Electrical Engineering

Mrs. M. Anitha
Project Associate

Mr. P. Prabhakar Rao
Senior Project Advisor

Physics

Dr. P. Mohanapriya
Senior Project Officer

Mr. Voma Uday Kumar
Junior Technical Superintendent

Mechanical Engg.

Mr. B. Ramesh Kumar
Junior Technical Superintendent

Mr. Midathana Ramesh
Junior Technician

Workshop

Mr. A. Rameshkrishnan
Junior Technical Superintendent

Mr. Parthiban K
Junior Technician

Mathematics

Mr. M. Radhakrishnan
Project Officer

Non-Academic Staff

Some recently retired staff members from the organisations such as ISRO and IIT Madras were appointed at IIT Tirupati on contract basis. In addition, some staff members were also recruited on ad hoc basis to support smooth running of the Institute. The following is a department-wise list of all the non-academic staff members at IIT Tirupati during 2016-17:

Administration

Mr. V. Adinarayana
Project Advisor

Ms. Sheela Reddy T.
Assistant Registrar

Mrs. Sandhya Y.
Junior Superintendent

Mr. Ramoji Rao
Junior Assistant

Mr. V. G. Arul Prasad
Junior Assistant

Academic Affairs

Mr. P. Midhun Kumar
Project Associate

Mr. S. L. Pradeep Valan
Senior Project Officer

Mrs. Bhanumathi
Project Associate

Mr. R. Lokesh
Project Associate

Accounts

Mr. T. Siva Kumar
Project Advisor

Mr. Y. Vijay
Senior Project Assistant

Industry Relations

Dr. Tora Mitra Ganguli
Principal Project Officer

Computer Center

Ms. R. Aswini
Junior Technical Superintendent

Mr. T. Senthil
Junior Technical Superintendent

Mr. M. Venkat Reddy
Junior Technical Superintendent

Mrs. Devi Prashanthi
Project Officer

Mr. G. Ramesh
Senior Project Officer

Mr. T. T. Manigandan
Project Officer

Engineering Unit

Mr. P. P. Chowdary
Senior Project Advisor

Mr. Senthamil Selvan
Junior Engineer

Mr. G. Narayanan
Project Associate

Ms. K. Poornasri
Project Associate

Hostels

Mr. K. S. Janakiraman
Senior Project Assistant

Ms. M. Pushpavathi
Care Taker

Library

Dr. B. Saibaba
Deputy Librarian

Mr. P. Chandra Siva Kumar
Project Associate

Mr. V. R. Lokanaresh
Senior Project Assistant

Purchase

Mr. K Govinda Chetty
Project Advisor

Mr. C. Madurai Muthu
Senior Project Associate

Mr. S. Anjaneyulu
Junior Assistant

Swayam Prabha Project

Mr. Arun S.
Senior Project Officer

Mr. Manikandasivam G.
Project officer

3. Academic Programmes

IIT Tirupati admitted 114 students to its B. Tech programme in the branches of Civil Engineering, Computer Science and Engineering, Electrical Engineering, and Mechanical Engineering. Further, to strengthen research capacity of the Institute, students were also admitted in MS (Research) and PhD programmes. Admissions to B.Tech in Chemical Engineering, and M.Tech in Computer Science and Engineering, Electrical Engineering, and Mechanical Engineering are being offered from the academic year 2018-19. The present section of the report details about the student statistics, and fellowship opportunities available to the students at the Institute.

3.1 Student Statistics

B. Tech Programme

IIT Tirupati takes pride in claiming to retain the maximum percentage (17%) of girl students registered with the Institute among all the IITs in the country. Year-wise break-up of the students admitted to various programmes is summarised in the tables below:

Table 3.1: Details of the B.Tech students admitted in academic year 2017-18

	General		OBC		SC		ST		Total
Year	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	
2015	44	7	28	4	11	6	7	2	109*
2016	47	9	25	8	16	2	8	1	116**
2017	45	10	29	3	17	1	6	3	114

* including 2 preparatory course Students
** including 1 preparatory course Student

MS (Research) Programme

Table 3.2: Details of the MS Scholars admitted in the academic year 2017-18

Year	Boys	Girls	Total
2017	12	2	14

PhD Programme

Table 3.3: Details of the PhD Scholars admitted in the academic year 2017-18

Year	Boys	Girls	Total
2017	12	2	14

Table 3.4: Details of the students enrolled in the Institute

Programmes	Boys	Girls	Total
B.Tech	280	56	336
MS (Research)	12	2	14
PhD	12	2	14
Total	304	60	364

3.2 Financial Assistance Available

The scholarships available to the students admitted to the B.Tech Programme in the Institute include Institute Merit-cum-Means (MCM) Scholarship, SC/ST Scholarship and Institute Free Studentship as per the Government of India norms. A table is given below for the reference:

Table 3.5: Details of the scholarships offered to the students in the academic years 2015-16, 2016-17, and 2017-18

Sl.No.	Type of Scholarship	Details of Scholarship	No. of Students		
			2015	2016	2017
1.	The Institute Merit-cum- Means scholarship for students whose parents income is less than Rs. 4.5 lakhs per annum	▪ Exempted payment of tuition fee ▪ Rs. 1000/-per month	27	30	29
2.	The Institute Free Studentship for students whose parent's income is less than Rs. 4.5 lakhs per annum	▪ Exempted payment of tuition fee	7	11	11
3.	SC/ST Scholarship	▪ Rebate in mess charges up to Rs. 8000 per semester ▪ Free lodging ▪ Rs. 250/- per month pocket allowance	7	9	10

Fellowship Available to MS (Research), and PhD Scholars

The students admitted to MS (Research), and PhD programmes get a fellowship of Rs. 12,400/month, and Rs. 25,000/ month, respectively.

4. Academic Infrastructure

Developing sufficient academic infrastructure has been one of the primary objectives of IIT Tirupati. In line with the same, the Institute created the necessary infrastructure including classrooms, laboratories and Central Library on its Temporary campus to meet the expectations and requirement of the students initially. The Institute has almost finished building its transit campus, where all engineering laboratories, and workshop are going to be shifted from the ensuing semester. The transit campus of the Institute also includes the classroom complex. The Institute has two well established laboratories for basic sciences on its temporary campus. This section of the report provides a glimpse of the central facilities and laboratories created in the Institute.

4.1 Classrooms

The temporary campus building of the Institute houses two 30-seater classrooms, eight 60-seater classrooms, and one 120-seater classroom with all the necessary furniture. In addition to it, one 120-seater, two 90-seater, and one 60-seater classrooms have also been built on the transit campus of the Institute. All the classrooms are equipped with desktop computers with Internet access, projectors, screens and audio systems. The classrooms are appropriately treated for the improved acoustics. Also, a 120-seater electronic virtual classroom with video conferencing facilities with a 1 Gbps bandwidth connection to the National Knowledge Network (NKN) is already in use for the purpose of holding interactive classes, and invited talks on the temporary campus.

4.2 Computing & Network Facilities

Computer Laboratories

IIT Tirupati has set up two computer laboratories in its temporary campus building to enable the students to perform software-based experiments and programming.

Computer Laboratory – 1

Computer lab-1 is equipped with 60 All-in-One Lenovo desktop computers each with 21.5" display, Intel i5 CPU, 8GB RAM, 1TB hard disk.

A view of Computer Laboratory –1

Computer Laboratory – 2

Computer laboratory-2 is equipped with 30 Apple iMAC computers, each with 21.5" Retina Display, Intel i5 CPU, 16GB RAM, and 1TB hard disk.

A view of Computer Laboratory –2

Institute server facility

The Institute has four rack servers and two blade servers used to host Institute website, LDAP authentication and Moodle open source application for academic purposes. The details of servers are listed below,

- HP servers (3 Nos) - Each server E5 Intel Xeon 24-core CPUs, 256GB RAM, with a common SAN storage of 20TB.
- GPU based HP server (1 No) - E5 Intel Xeon 24-core CPUs, 256GB RAM, with 32GB NVIDIA Tesla GPU card.
- IBM Server - M4 Intel Xeon 12-core CPUs, 128GB RAM, with 10TB storage
- Lenovo blade server - M5 Intel Xeon 12-core CPUs, 64GB RAM, with 600GB storage.

Software available

The Institute has bought the rights and license of required software for academic and research purposes.

- VM Ware ESXi6.5 Standard with virtual NVIDIA GPU license.
- Kasperskey Antivirus
- Microsoft Office 2016
- Autocad 2016 (EDU) (Unlimited)
- Creo S/w
- MATLAB 2018A (Unlimited)
- COMSOL
- ORCAD Schematic Capture and PSPICE
- ORCAD PCB and auto routing software
- VIVADO s/w

- SIMULIA ABAQUS SOFTWARE
- Ansys
- Bentley
- Adobe
- Chem Draw Professional
- Mestrec
- Geo Studio 2018
- Windows server license
- Windows usercal license
- Windows RDB license
- Turnitin

Internet Facilities

The Institute has a dedicated high speed 1Gbps Internet connection. IIT Tirupati is fully networked academic campus with Wi-Fi and wired connectivity within the buildings, and uses point-to-point RF to connect academic building with the guest house, and the hostels situated in the vicinity.

4.3 Science Laboratories

For the undergraduate students of the first year, and Ph.D. scholars in these subjects, Physics and Chemistry laboratories with state-of-the-art facilities have been developed on the temporary campus. During the year 2017-18, the laboratories got more equipped with some added significant apparatuses for the experiments. Following are the details of the science laboratories on the campus:

Chemistry Laboratory

The undergraduate Chemistry laboratory was established in January 2016. It is well equipped with modern state-of-the-art equipment. The Chemistry laboratory experiments are designed to expose students to diverse concepts of chemical sciences and engineering. Some of the present experiments are listed below:

- Determination of permanent and temporary hardness of water samples collected from the neighborhood using complex metric titration
- Laboratory synthesis of Aspirin molecule
- Extraction of caffeine from tea leaves
- Determination of the acid strength of a fruit juice (citric acid) solution using conduct metric titration
- Estimation of metal content in an alloy using colorimeter: Amount of copper in Brass

Major equipment available in the chemistry laboratory are as follows:

Benchtop conductivity meter	Magnetic stirrer with hot plate (1 lit capacity)
Benchtop pH meter	Precision gold balance
Distilled water plant - 4 lit Capacity	Analytical balance
Digital colorimeter	Rotary vacuum pump - 300 rpm
Hot plate - 8 inch-diameter	UV-cabinet-with UV filter
Melting point apparatus	Heat Gun
Water bath - 6 holes	Hot air oven
Ice flake machine	Oil free portable vacuum pump

A view of Chemistry Laboratory

Physics Laboratory

A view of Physics Laboratory

The Physics Laboratory is one of the labs that were started with the inception of the Institute. It got updated with 10 desktop PCs, and 20 external monitors with Intel i3 CPU, 4GB RAM, and 500GB hard disk. The laboratory includes state-of-the-art facilities to conduct nearly 10 experiments at UG level, and it also has sufficient equipment to cater to the needs of the research scholars in the field.

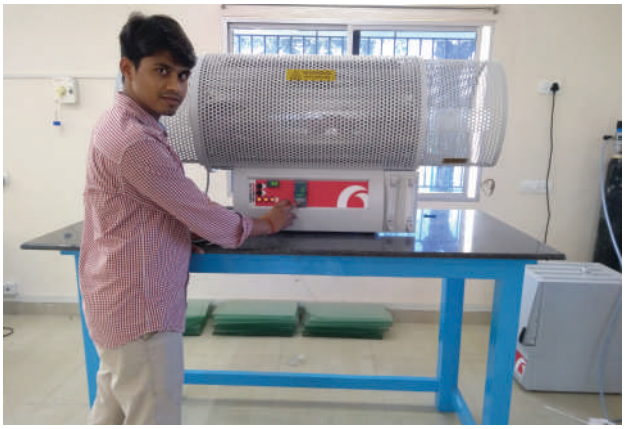
Further, the laboratory is equipped with some seminal instruments for performing the experiments more effectively. Following are some instruments which enrich the performance of the laboratory in terms of its effectiveness:

Equipment present in the Physics Laboratory:

- Compound pendulum with accessories (five sets)
- Ultrasonic interferometer (five sets)
- Experimental setup for obtaining Stefan's constant (five sets)
- Newton rings experiment (six sets)
- Spectrometer with diffraction grating (six sets)
- Mapping of equipotential lines with electrode configuration (five sets)
- Digital oscilloscope (six sets)
- Hall effect apparatus with accessories (five sets)
- Planck's constant using LEDs (five sets)
- Simulation laboratory using MAT LABORATORY (10 sets)
- Forbe's method apparatus
- Linear air track with digital timer (one)
- Timing car + plane ramp + accessories + inclined plane accessory + curved ramp (one)
- Four-probe method of measurement of conductivity (four sets)
- Strain gauge for stress/strain measure-ments (four sets)

Carbolite Gero UK Tube Furnace (model GHA 12/600)

The Carbolite Gero tubular furnace with single zone (GHA) got installed in the Physics laboratory this year only. Using which, one can synthesize a



Carbolite Gero UK Tube Furnace

large variety of materials until the maximum temperature up to 1200°C and in different environments such as vacuum, gas flow (O_2, Ar, N_2), etc. An additional quartz tube is available, which can be used for preparing the materials in high-vacuum. A rotary vane pump is also there that can be attached to create the vacuum up to 10^{-2} mbar. Insulation plugs & radiation shields are available to prevent heat loss to improve uniformity.

Nano-REVTM: A Table-top Scanning and Tunneling Microscope (STM)

A scanning tunneling microscope (STM) is an experimental tool for imaging the surfaces at the atomic level. STM works on the principle of quantum mechanics such as quantum tunneling. When a conducting tip is brought very close to the surface of the sample, a voltage difference applied between the tip and surface can allow the electrons to tunnel through the air between them. The resulting tunneling current is a function of tip position, applied voltage, and the local density of states (LDOS) of the sample. Information is acquired by monitoring the current as the tip's position scans across the surface, and is usually displayed in the image form. Nano-REVTM is a Scanning and Tunneling Microscope (STM) which is a table-top equipment and works at ambient air conditions. It comes with a superb combination of ease-of-use and high-level of sophistication, making it a ready-to-use instrument both for the beginners and the experts in the field of probe microscopy.

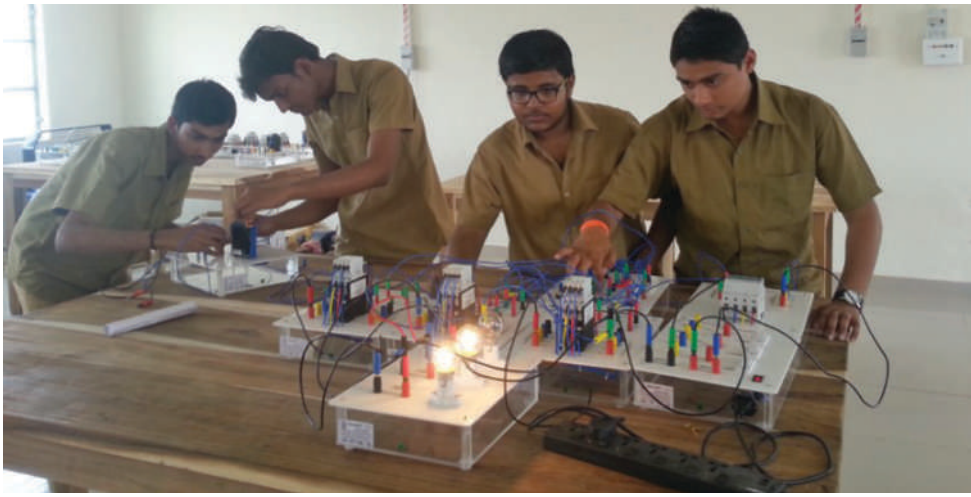
Electro Spinning Instrument (ESPIN NANO)

The Electro Spinning Apparatus is one of the key instruments of the Physics laboratory, which is capable of producing nanofibers of polymers & metal oxides. The Nano fibrous membrane produced from the instrument is applicable in diverse fields like infiltration, tissue engineering, drug delivery system, catalysis, dye-sensitized solar cells, battery separators etc. Prof. T. S. Natarajan, faculty in Physics, IIT Tirupati who developed this national award-winning Electrospinning Instrument (while in service at IIT Madras) is actively involved in research on nanofibers at IIT Tirupati.

Students conducting experiment in Electro spinning Apparatus

Workshop

In the first semester, workshop training sessions for all the branches of engineering were held in the workshop facilities available at Sri Venkateswara University, Tirupati. The second semester workshop sessions were conducted at IIT Tirupati by procuring and installing the necessary equipment, including pneumatics and hydraulics



Students being trained in the workshop

training kits, a plastic injection moulding machine and FRP fabrication facilities on campus. Basic electrical and electronics lab, and instrumentation and communication Laboratory were set up for workshop practice.

Equipment at the Workshop:

- Manual Injection moulding M/c
- Air compressor
- Air Dyer
- Pneumatic training kit
- Electro- Pneumatic training kit
- Hydraulic training kit
- Electro- Pneumatic training kit
- Hydraulic training kit
- Welding Simulator
- Switch Module
- Lamp Module
- Tube light module
- MCB & ELCB Module
- Conductor module
- OLR Module
- Push button Module
- Timer Module
- MCB Module
- ESAB- 400 Amps Arc Welding Transformer

4.4 Engineering Laboratories

Faculty members of the different streams of Engineering at IIT Tirupati are keenly involved in developing laboratory facilities for their respective disciplines. Details of the laboratories developed or being developed during the year 2016-17 are hereunder:

Electrical Engineering Laboratory

IIT Tirupati has developed an Integrated Electronics laboratory for offering hardware and software laboratory courses for both Electrical and Computer Engineering students starting from 3rd semester. The Institute offers Electronics laboratory for all the 4 branches in the 1st year as a part of workshop practice.

A view of Electrical Engineering Laboratory

The Institute has procured FPGA boards which can be used for both introductory B.Tech laboratory courses as well as advanced VLSI design courses and projects. The Zynq-Zybo 7000 series board has on-chip (SoC) Dual-core ARM Cortex-A9 processor with Xilinx 7 series and FPGA has on-board memory and both Audio and Video I/O's and CODEC's. With on-board high bandwidth peripheral controllers such as 1G Ethernet, USB 2.0, SDIO, it can be used for developing audio and video processing algorithms.

The OrCAD schematic capture and PSPICE tools are very helpful in analysing transistor and OpAmp amplifiers characteristics, DC analysis, AC analysis and transient analysis of any circuit (either passive or active). The transistor bias point fixing is useful for optimal performance. PSPICE software is a powerful tool as it enables the students to simulate the whole circuit either fully analog or fully digital or mixed type, and perform Monte Carlo analysis, determining the performance of the same at extreme temperatures and voltages. This tool can be used for research too.

Equipment present at the Electrical laboratory:

- Regulated DC Power Supply (4-in-one) (LQ6324T)
- Arbitrary Function generator (AFG 1022)
- Digital Oscilloscope (TBS 1102B-EDU) 100MHz
- Digital Oscilloscope (TBS 1202B-EDU) 200 MHZ
- Digital Multimeter (SM7023)
- Xilinx FPGA Board ZYNQ-ZYBO
- VIVADO software
- ORCAD Schematic Capture and PSPICE
- ORCAD PCB and auto routing software
- Desktop PCs with i5 processor HP LV2011
- LCD Projector
- D-Link 16 port switch
- D-Link 8 port switch
- Printer M435
- Laboratory tables with Granite top and Electrical fittings
- Revolving Chairs

In addition to these facilities, a Signal Processing and Machine Learning laboratory has been set up to meet the requirements of higher semester Electrical Engineering students. This laboratory comprises:

- 30 desktops PCs (with 20" external monitor, Intel i5 CPU, 8GB RAM, and 500GB hard disk) to experiment with Signal Processing and Digital Communication algorithms using MATLAB
- TMS320C6748 DSP kits for learning hardware signal processing programming and demonstration on real signals/images.
- 4 High end workstations with recent NVDIA GTX 1080 GPUs (four in each) for computationally intensive Image processing, Computer vision and Machine Learning operations.

Further, Analog Devices India (ADI) has expressed interest in establishing a Digital Signal Processing (DSP) laboratory by equipping IIT Tirupati with 20 M1K learning kits and 20 high end DSP Processors. Plans are underway to set-up an Electrical Machines laboratory for the 3rd year B. Tech students. Finally, to cater to the needs of the final year B. Tech students, work is in progress towards establishing an Advanced Electrical Engineering Laboratory which is going to be a multidisciplinary laboratory for guiding final year Electrical Engineering students. Here the objective is to introduce students to advance topics in interdisciplinary areas of Engineering such as Internet of Things, Robotics, Cloud computing, Advanced Electro-hydraulics, Advanced Electro-Pneumatics, Programmable controllers for industrial automation, Renewable Energy systems (Solar and Wind), etc.

Surveying Laboratory

The surveying laboratory is equipped with wide range of instruments available for conducting the experiments. This included relatively simple equipment like Prismatic Compasses, Vernier Theodolites, Dumpy Levels, Plane Tables and associated accessories like Ranging Rods, Cross Staffs, Arrows, Pegs etc. More sophisticated equipment, such as Auto Levels, Hand-held GPS devices, and Total Station (5" and 1" accuracy) are also there in the laboratory. Civil Engineering students are trained to use all the necessary equipment in order to learn the fundamentals of surveying.

Faculty helping the student in surveying

The equipment related to Geotechnical Engineering was purchased for the class room demo; a list of the same is given below:

- Liquid Limit Device with counter and one casagr and grooving tool H
- Sand Pouring Cylinder Apparatus, Smal
- Rammer 4.9 kg x 450mm controlled fal
- Compaction Test Apparatus, manual - Light Compactio
- Core cutte

Applied Mechanics Laboratory

Applied mechanics laboratory has been set up for the students to perform experiments related to basic principles of solid mechanics and fluid mechanics. Solid mechanics experiments include universal testing machine for tensile tests, hardness testing machine, torsion measurement, stresses in thick and thin cylinders, strain measurement using strain gauges, bending of beams, photo elasticity measurements and impact tester.

The Fluid Mechanics Laboratory is designed to fortify student's theoretical knowledge which they learned in Fluid mechanics course.

Applied Mechanics Laboratory

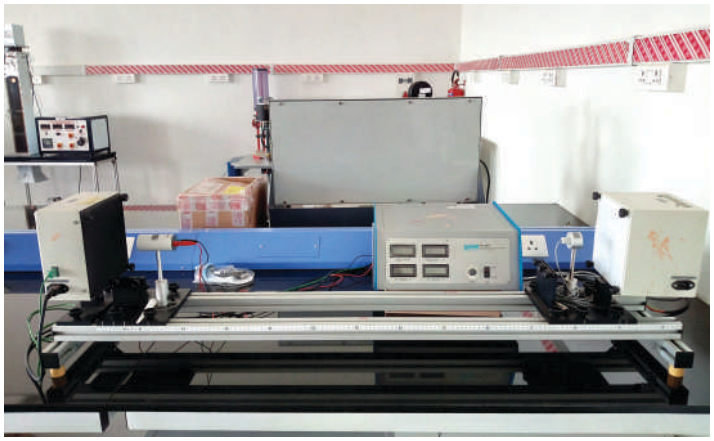
The laboratory consists of following experimental setups

- Reynolds experiment setup to visualize laminar and turbulent flow
- Different flow measuring set-ups such as venturimeter, orifice-plate, rotameter
- Free and forced vortex experimental setu
- Impact of jet on surfaces to verify momentum conservatio
- Experimental setup to verify Bernoulli's theorem
- Experimental setup to study losses in different pipe segment
- Fluid property measurement equipment to measure density, viscosity, surface tension.
- Water flow bench to visualize flow around different shape
- Experimental setup to study stability of floating bodies

Heat Transfer Laboratory

The heat transfer laboratory has various experimental setups to enhance students understanding on concepts of heat transfer. This laboratory consists of following experimental setups:

- Thermal conductivity measurement of solids and fluids
- Linear and Radial heat conduction setups
- Free and forced convection over different objects
- Pool boiling and condensation experimental setup
- Heat exchanger setup with tube in tube, shell and tube, Plant and fin and jacketed vessel heat exchangers
- Different temperature measurement instruments and their calibration
- Thermal conductivity measurements of insulating materials
- Experimental setup to verify Kirchhoff's law and Stephen Boltzmann Law



Heat Transfer Laboratory

4.5 Central Library

The Central Library of the Institute was established in the year 2015 with a mission to facilitate learning, teaching, and research in IIT Tirupati by providing information resources and services. In accordance with the objectives of the Institute, the Library aims to develop a comprehensive collection of resources including e-resources which will be useful for the faculty and students and support their scholarly advancements.

The Central Library is in a fast growing stage. The Central Library added more than 1500 printed books including textbooks and reference books on Engineering, Science, and Humanities & Social Sciences during this period. Central Library added 519 e-books from six different publishers. We also added nearly 2000 e-journals/standards/databases this year that include the journals provided by e-Shodh Sindhu. This Library is equipped with modern technology of library automation system using KOHA open source integrated library software with Online Public Access Catalogue (OPAC).

Total number of resources available in Central Library as on 31st March 2018 is as follows,

- Books 4474
- CD-ROM 80
- Newspapers 08
- E-Journals 2000

e-Shodh Sindhu Consortium Membership

The Central Library is an active member of e-Shodh Sindhu Consortium.

Workshop Organised

The Central Library organised a workshop on KOHA Library Management Software for the benefit of library and computer centre staff on May 11th and 12th, 2017. Several other Engineering College Librarians also attended the workshop.

A view of the Central Library

5. Research Publications & Achievements

IIT Tirupati fosters a rich academic environment, where faculty members and students are actively engaged in innovative teaching-learning activities contributing to the technical growth of the nation. Institutes like IITs are well known for their research contributions; in this line, the faculty members of IIT Tirupati are vigorously involved in research and development of technical advancements. All the faculty members of the Institute are also engaged in quality research publication, and presentation of their research outputs at the prestigious conferences of international repute. The research contribution in terms of publication, conference participation, research projects undertaken, is highlighted in the present chapter of the report:

5.1 Research Publications

Journals

Civil Engineering

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- M. Rajamani, and **S. M. Maliyekkal.** "Chitosan Reinforced Boehmite Nanocomposite Desiccant: A Promising Alternative to Silica Gel." *Carbohydrate Polymers*, Elsevier, vol. 194, 2018, pp. 245-25.
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- Ram, V. G., and **K. N. Satyanarayana.** "Estimation of C&D Waste Using Waste Generation Rates in Chennai, India", Waste Management & Research, Volume 6 (5), 2017, pp. 610-617.
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- Vilventhan, A., and **K. N. Satyanarayana.** Utility Relocation Management in Highway Projects, *Built Environment Project and Asset Management,* Volume 8 Issue: 2, February 2018, pp. 171-82.

Computer Science and Engineering

- Pandey, P. K., and **V. Badarla.** "Reconstruction of Network Topology Using Status-time-Series Data." *Elsevier Journal Physica A*, vol. 490, no. 1, January 2018, pp. 573-583.
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Electrical Engineering

- Aneesh, R. S. S., Madhu S. Nair, **R. K. Sai S. Gorthi.** "Satellite Image Resolution Enhancement Using Nonsubsampled Contourlet Transform and Clustering on Subbands." *Journal of the Indian Society of Remote Sensing, Springer,* vol. 45, no. 4, December 2017, pp. 979–991.
- Gopakumar, G., M. Swetha, S. S. Gorthi, and **R. K. Sai S. Gorthi.** "CNN Based Malaria Diagnosis from Focus-Stack of Blood Smear Images Acquired Using Custom-Built Slide Scanner." *Journal of Biophotonics*, vol. 11, no. 2, March 2018.
- Haribabu, A. Jain, Swetha, Deepak M, **R. K. Sai S. Gorthi.** "Incorporating Rotational Invariance in Convolutional Neural Network Architecture." *Pattern Analysis and Applications (Springer),* February 2018, pp. 1–14.
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- Sharma, V. K., and **E. Anil Kumar.** "Thermodynamic Simulation of Hydrogen Based Solid Sorption Heat Transformer." *International Journal of Thermal Sciences*, vol. 125, March 2018, pp. 74-80.
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Chemistry

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- Radhakrishnan, M., **S. Rajesh,** and S. Agarwal. "Some Fixed-Point Theorems on Non-Convex Sets." *Applied General Topology*, vol. 18, no. 2, October 2017.
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- **Bahinipati, C. S.** "Economic and Non-Economic Loss and Damage from Droughts in Western India: The Role of Adaptation Measures." *Addressing Non-Economic Losses and Damages Associated with Climate Change: Learning from Recent Past Extreme Climatic Events for Future Planning*, Eds., Chiba, Y. and S.V.R.K. Prabhakar, Asia Pacific Network for Global Change Research and Institute for Global Environmental Strategies, September 2017, pp. 53-74.
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5.2 Conferences

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- Debopam Roy, **K. N. Satyanarayana,** and Arun Menon. "Overview of project governance framework for heritage conservation in India." *International Conference on professionalism in built heritage sector*, RLICC Thematic Week Leuven, Belgium, 5-8 February 2018.
- Debopam Roy, **K. N. Satyanarayana,** and Arun Menon. "Contractual framework for stakeholder interaction for heritage conservation projects in India." *Scientific Symposium of 19 th ICOMOS General Assembly*. New Delhi, India, 13-14 December 2017.
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- G. Saha, and **K. P. Biligiri.** "Investigation of Crack Initiation Behavior of Asphalt Mixtures: Fatigue Study Through Dynamic SCB Test." *An International Conference on Advances in Construction Materials and Systems*, Indian Institute of Technology Madras, Chennai, RILEM2017, 3-8 September 2017.
- H. N. Vinay, Francisco Silva, Jorge B. Sousa, George B. Way, and **K. P. Biligiri.** "Assessment of Threshold Film Thickness Using Surface Area for RAR Modified Asphalt Mixtures." *Rubberized Asphalt-Asphalt Rubber 2018 Conference*, Kruger Park, South Africa, 25-28 September 2018.
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- M. Rajamani, S. K. Modak, R. Kannapiran, and **S. M. Maliyekkal.** "Unprecedented Cr (VI) Uptake Capacity of Granulated Boehmite Nano architecture." *International conference on Nanotechnology: Ideas, Innovations and Intiatives-2017,* Indian Institute of Technology, Roorkee, 6-8 December 2017.
- N. Neethu, T. Choudhury, and **S. M. Maliyekkal.** "Fe (III) Mn (III) Embedded Oxide Adsorbent Material for Effective Arsenic Removal from Water." *Proceedings of the international conference on Energy, Environment, and Industrial Safety,* AC Tech, Anna University, Chennai, 22-23 February 2018.
- S. Kumar, V. Venudharan, **K. P. Biligiri,** and J. B. Sousa. "Performance Characterization of Reacted and Activated Rubber Modified Gap Graded Asphalt Mixtures." *Rubberized Asphalt-Asphalt Rubber 2018 Conference,* Kruger Park, South Africa, 25-28 September 2018.
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- V. G. Ram, A. Mahalingam, and **K. N. Satyanarayana.** "Institutional struggle behind the diffusion of C&D waste recycling practices", *Proceedings of the 15th Engineering Project Organization Conference* with 5th International Megaprojects Workshop, Stanford Sierra Camp, California, 5-7 June 2017.

Computer Science and Engineering

- V. Bhalla, K. Garg, S. S. Salvi, **V. Badarla,** D. Fulwani, V. Khullar, M. M. Rao, A. Chakrapani, N. Krishnan, and H. Tyagi. "Utilization of Nanoparticle-Based Solar Energy Systems for Improving the Overall Energy Efficiency of Buildings." *Second International Conference on Sustainable Energy and Environmental Challenges (SEEC-2018)*, Indian Institute of Science (IISc), Bangalore, 1-3 January 2018.
- G. V. R. J. Sai Prasad, **S. Chimalakonda,** and Venkatesh Choppella. "Towards a Domain-Specific Language for the Renarration of Web Pages." *In Proceedings of the 11th Innovations in Software Engineering Conference,* ACM, 9-10 February 2018.
- G. V. R. J. Sai Prasad, V. Choppella, and **S. Chimalakonda.** "A Style Sheets Based Approach for Semantic Transformation of Web Pages." *In Proceedings of the International Conference on Distributed Computing and Internet Technology,* Springer, 11-13 January 2018.
- V. Nithin, Avan Rathod, **V. Badarla,** Tim Humernbrum, and Sergey Gorlatch. "Efficient Load Balancing for Multicast Traffic in Data Center Networks Using SDN." *10th IEEE International Conference on Communication Systems and NETworkS (COMSNETS)*, 3-7 January 2018.
- V. Sharma, R. Musarrat, **S. Chimalakonda,** and Y. R. Reddy. "Muse: A Musically Inspired Game to Teach Arrays and Linked Lists." In Chen, W. *et al.* (Eds.), *the 25th International Conference on Computers in Education,* Asia-Pacific Society for Computers in Education, New Zealand, 4-8 December 2017.

Electrical Engineering

- Aparna, Rahul, M. Deepak, and **R. K. Sai S. Gorthi.** "Effective Denoising with Non-local Means Filter for Reliable Unwrapping of Digital Holographic Interferometric fringes." *International Conference on Computer Vision & Image Processing' (CVIP-2017),* IIT Roorkee, 10-12 September 2017.
- A. Jain, Deepak M, and **R. K. Sai S. Gorthi.** "Rotation Invariant Digit Recognition Using Convolutional Neural Network."*'International Conference on Computer Vision & Image Processing' (CVIP-2017),* 10-12 September 2017.
- A. Jain, M. Deepak, and **R. K. Sai S. Gorthi.** "Stacked Features Based CNN For Rotation Invariant Digit Classification." *An International Conference on Pattern Recognition and Machine Intelligence (PReMI-2017),* ISI-Kolkata, 6-8 December 2017.
- B. Rajeswari, Srivalsan, N. R. Rao, and **R. K. Sai S. Gorthi.** "Batch Mode Active Learning Based Superpixel Library Generation for Very High-Resolution Aerial Image Classification." *IEEE Workshop on International Conference on Computational Intelligence (ICCI),* IIT Kanpur, 5-6 December 2017.
- K. S. Kalmady, A. S. Kamath, G. Gopakumar, **R. K. Sai S. Gorthi,** and Gorthi Sai Siva. "Improved Transfer Learning through Shallow Network Embedding for Classification of Leukemia Cells." *9th International Conference on Advances in Pattern Recognition*, ISI-Bangalore, 27-30 December 2017.
- L. Rout, Sidhartha, **R. K. Sai S. Gorthi,** and M. Deepak. "Rotation Adaptive Visual Object Tracking with Motion Consistency" *IEEE Winter conference on Applications of Computer Vision (WACV),* Harvey's Casino in Lake Tahoe, NV/CA, USA, March 2018.
- M. Madalasa, M. Tapas, N. R. Rao, M. Deepak, and **R. K. Sai S. Gorthi.** "Bayesian Approach for Landslide Identification from High Resolution Satellite Images." *International Conference on Computer Vision & Image Processing' (CVIP-2017)*, IIT Roorkee, 10-12 September 2017.

- K. Mounica, R. Sheeba, and **R. K. Sai S. Gorthi.** "Stochastic Assimilation Technique for Cloud Motion Analysis. "*International Conference on Computer Vision & Image Processing' (CVIP-2017),* IIT Roorkee, 10-12 September 2017.
- V. Pallavi, M. Deepak, and **R. K. Sai S. Gorthi.** "The Visual Object Tracking VOT2017 Challenge Results." *IEEE International Conference on Computer Vision (ICCV) Workshop*, 22-29, October 2017, pp. 1949-1972.
- S. Pinaki, M. Deepak, and **R. K. Sai S. Gorthi.** "Classification of Breast Masses Using Convolutional Neural Network as Feature Extractor and Classifier."*International Conference on Computer Vision & Image Processing' (CVIP-2017),* IIT Roorkee, 10-12 September 2017.
- S. Pinaki, M. Deepak, and **R. K. Sai S. Gorthi.** "Improving Isolated Bangla Compound Character Recognition Through Feature-Map Alignment." *9th International Conference on Advances in Pattern Recognition (ICAPR-2017),* ISI-Bangalore, 27-30 December 2017.
- Pinaki S., M. Deepak, and **R. K. Sai S. Gorthi.** "Automatic Attendance System Using Deep Learning Framework." *International Conference on Machine Intelligence and Signal Processing,* IIT Indore, 22-24 December 2017.
- B. Rajeswari, N. R. Rao, and **R. K. Sai S. Gorthi.** "Learning Based Fuzzy Fusion of Multiple Classifiers for Object Oriented Classification of High-Resolution Images." *International Conference on Computer Vision & Image Processing' (CVIP-2017),* IIT Roorkee, 10-12 September 2017.
- S. Mukherjee, **K. P. Naveen,** N. Sudarsanam, and B. Ravindran. "Efficient-UCBV: An Almost Optimal Algorithm Using Variance Estimates." *AAAI '18, The 32nd AAAI Conference on Artificial Intelligence,* New Orleans, USA, 02-07 February 2018.

Mechanical Engineering

- **E. Anil Kumar,** Dhananjay Mishra, and V. K. Sharma. "Estimation of Enthalpy of Formation of Metal Hydrides – Effect of Different Measurement Parameters." *6th International Conference on Advances in Energy Research*, IIT Bombay, Mumbai, 12-14 December 2017.
- S. K. Singh, and **E. Anil Kumar.** "Surface Remodeling of Zeolite 4A for CO_2 Capture: A Case Study." *6th International Conference on Advances in Energy Research (ICAER 2017),* IIT Bombay, 12-14 December 2017.
- T. Kumar, **D. V. Kiran,** and Navneet Arora. "Probing the Influence of Welding Current and Filler Wire Inclination on the Temperature Distribution in Aluminium and Steel Joining." *International Conference on Advances in Materials and Processing: Challenges and Opportunities,* IIT Roorkee, 1 December 2017.
- V. K. Singh, and **E. Anil Kumar.** "Estimation of Thermodynamic Properties of CO_2 Adsorption on Activated Carbon." *6th International Conference on Advances in Energy Research (ICAER 2017),* IIT Bombay, 12-14 December 2017.

Chemistry

- **A. K. Manna,** S. R. Abramson, A. M. Reilly, A. Tkatchenko, J. B. Neaton, and L. Kronik. "Quantitative Prediction of Optical Absorption in Molecular Solids from an Optimally-tuned Screened Range-separated Hybrid Functional."*JNCASR-I2CAM Energy School*, Bangalore, 27 November-2 December, 2017.

Physics

- A. Ganesan, **P. C. Deshmukh,** A. S. Kheifets V. K. Dolmatov, and S. T. Manson. "Photoionization Time Delay in Atomic Barium." *30th International Conference on Photonic, Electronic and Atomic Collisions (ICPEAC XXX)*, Cairns, Australia, 26 July-1 August, 2017.

- A. Mandal, **P. C. Deshmukh,** V. K. Dolmatov, A. Kheifets, and S. T. Manson. "Angular Dependence of Wigner-Eisenbud-Smith Time Delay in Photoionization: A Case Study on 4f Subshell of Atomic Mercury." *30th International Conference on Photonic, Electronic and Atomic Collisions (ICPEAC XXX),* Cairns, Australia, 26 July-1 August, 2017.
- A. Mandal, **P. C. Deshmukh,** V. K. Dolmatov, A. Kheifets, and S. T. Manson. "Confinement Effects and Angular Dependence of Wigner-Eisenbud-Smith Time delay." *30th International Conference on Photonic, Electronic and Atomic Collisions (ICPEAC XXX),* Cairns, Australia, 26 July -1 August, 2017.
- S. Banerjee, **P. C. Deshmukh,** A. Kheifets, V. K. Dolmatov, S. T. Manson. "Study of Angular Dependence of Photoionization time Delay in nd → f Channels for Zn, Cd and Hg Using RRPA." *30th International Conference on Photonic, Electronic and Atomic Collisions (ICPEAC XXX), Cairns,* Australia, 26 July-1 August, 2017.

Mathematics

- **Srijanani A. P.,** and G. P. Kapoor. **"**Interpolation of Hybrid Structures Using Fractal Theory." *83rd Annual Conference of IMS - An International Meet,* Sri Venkateswara University, Tirupati, 12-15 December 2017.
- S. Mukhopadhyay, and **I. Das.** "Robust Designs for Multinomial Response Models: A Method of Selecting Optimal Designs for Multivariate Spatial Experiments." *International Conference on Changing Paradigms and Emerging Challenges in Statistical Sciences (IPECS-2018)*, Dept. of Statistics, Pondicherry University, Pondicherry, 29-31 January 2018.

Humanities and Social Sciences

- **A. Raghuramaraju.** "Alternative Modernity and Religio-Political Philosophy of M. K. Gandhi." *An International Symposium on Secular Religiosity and Religious Secularity: Rethinking the Asian Agency in the Shaping of Modernity*, organized by U-PARL, University of Tokyo, Japan, 09 March 2018.
- **A. Raghuramaraju.** "Communicating Death: Deleuze Guattari and Sri Aurobindo's Savitri." *Plenary Lecture at an International Conference on Contemporary Communication Cultures: Controls and Becoming's,* University of Madras, Chennai, 16-17 February 2018.
- **C. S. Bahinipati,** and P. K. Viswanathan. "Can Wide Scale Diffusion of Resource Efficient Technologies Reduce Groundwater Utilization? Evidence from Water Scarce Regions of Gujarat, India." *15th GLOBELICS International Conference,* Athens, Greece, 11-13 October 2017.
- **C. S. Bahinipati,** and P. K. Viswanathan. "Incentivizing Resource Efficient Technologies in India: Evidence from Adoption of Micro-Irrigation in Dark-Zone Regions of Gujarat." *NABARD chair Institute of Economic Growth seminar*, Delhi, 8-9 March 2018.
- **C. S. Bahinipati,** and U. Patnaik. "Can Increasing Human Development and Income Reduce Impact from Natural Disasters? Empirical Evidence for Floods in India." *INSEE-KILA, An International Conference*, Kerala Institute of Local Administration (KILA), Thrissur, 8-10 November 2017.
- **C. S. Bahinipati.** "Loss and Damage from Climate Related Events in Odisha: Status, Issues and Challenges." *National conference on 'Transforming Odisha: Policies, Institutions and Innovations'*, Bhubaneswar, 3-4 March 2018.
- K.S.K. Kumar, and **C. S. Bahinipati.** "Loss and Damage from Climate-related Events: Case study of Tamil Nadu, India." 6th Madras School of Economics Seminar Retreat, Central University of Tamil Nadu, Thiruvarur, 17-18 January, 2018.
- **P. S. Dwivedi.** "Environmental Philosophy and Uttarrāmacarita." ICPR sponsored National Conference on *Philosophical Thoughts in Samskrit Drama Literature,* Karnataka Samskrit University, Bangalore, 27-28 March 2018.

- **P. S. Dwivedi.** "Hinduism and Contemporary India: Towards Dialectics of Tradition, Modernity and Westernization." *International Conference on Ideas of Harmonious Coexistence: Religions and Philosophies of India,* organised by JNU in collaboration with QJSP at JNU, New Delhi, 27-28 December 2017.
- **P. S. Dwivedi.** "Metaphysics of Question: A Study in Relation to Kenopaniṣada, Praśnopaniṣada, Bergson, and Deleuze." *International Conference on Contemporary Communication Culture, Controls and Becomings,* University of Madras, Chennai, 16-17 February 2018.
- **P. S. Dwivedi.** "Virtual Reality versus Real Virtuality: A Study in relation to Concurrence, Customization and Correlation." *International Conference on Technology, Religion and Cultural Identity: An Exploration from Comparative Multi-Polar Perspective,* organised by the University of Madras in collaboration with University of Belgrade, Serbia, at University of Madras, Chennai, 13-14 December 2017.
- U.Patnaik, P.K. Das, and **C. S. Bahinipati.** "Effect of Rural Livelihoods Project on Adaptation Decision and Farmers' Wellbeing in Western Odisha, India: Application of an Endogenous Switching Regression." *5th National Conference of Network of Rural and Agrarian Studies on Agrarian Transition and Rural-Urban Linkages in India in 21st Century*, Nabakrushna Choudhury Centre for Development Studies, Bhubaneswar, 27-29 October 2017.

5.3 Invited Lectures Delivered by the IITT Faculty Members

Civil Engineering

- **A. Ganguli:** **"**Non-Destructive Evaluation of Concrete through Ultrasonic Array-based Imaging." Luigia Binda Memorial Workshop on *Non-Destructive Testing and Safety Assessment of RC and Masonry Structures,* RILEM Week, IIT Madras, Chennai, 3-8 September 2017.
- **K. P. Biligiri:** "Effect of Aggregate Gradation on Rutting Performance of Asphalt-Rubber Gap Graded Mixtures." *International Conference on Advances in Construction Materials and Systems,* Indian Institute of Technology Madras, Chennai, RILEM2017, 5-6 September 2017.
- **K. P. Biligiri:** "Energy Efficient and Climate Resilient Materials and Products." *Seminar on Sustainable Development of Road Infrastructure,* organized by Roads and Building Department, Government of Gujarat, In Collaboration with Deloitte Touche Tohmatsu India LLP, supported by the World Bank, Hotel Narayani, Gandhinagar, Gujarat, 18-20 January 2018.
- **K. P. Biligiri:** "Relevance and Need for Expanding Use of Old Tyres in Roads." *Panel Discussion* organized by Chintan Environmental Research and Action Group, Indian International Centre, New Delhi, 28 February 2018.
- **K. P. Biligiri:** "Smart Pavement Technologies – Visions for Sustainable Transportation Infrastructure." Sponsored by Municipal Corporation of Tirupati & Smart City Council, Municipal Corporation of Tirupati, Tirupati, 11 October 2017.
- **K. P. Biligiri:** "Smart Pavement Technologies – Visions for Sustainable Transportation Infrastructure." Sponsored by Andhra Pradesh Road Transport Corporation, APRTC Roads and Buildings Department, Vijayawada, 9 October 2017.
- **K. P. Biligiri:** "Sustainable & Smart Pavement Technologies: Visions for Future." *Two-day Workshop on Recent Trends in the Field of Transportation Engineering,* organized by Department of Civil Engineering, Bapatla Engineering College, Andhra Pradesh, 17 February 2018.

- **K. P. Biligiri:** "Sustainable Roadway Infrastructure – Solutions for Smart Cities." *India-EU Dialogue Smart Cities: Sustainable Urbanisation,* organized by Heidelberg University, Delegation of the EU to India, ORF, BayIND in collaboration with SPA, CNRS, GIZ and Indo-German Chamber of Commerce, supported by Friedrich Naumann Stiftung für die Freiheit, Taj Gateway Hotel, Bangalore, 14 October 2017.
- **Prasanna V. Sampath:** "Understanding Fen Hydrology: A Data-Intensive Groundwater Modelling Approach." IISER Tirupati, 6 September 2017.
- **S. M. Maliyekkal:** "A Sustainable Solution for Point-of-Use Treatment of Water."*A national conference on Sustainable Clean Water Technology, SCWT17,* B. S. Abdur Rahman Crescent University, Chennai, Tamil Nadu, 21 September 2018.

Computer Science and Engineering

- **G. Ramakrishna:** "Design and Analysis of Algorithms." Chadalawada Ramanamma Engineering College, Tirupati, 3 March 2018.
- **G. Ramakrishna:** "Graph Algorithms." Narayana Engineering College, Nellore, 23 December 2017.
- **V. Mahendran:** "Buffer Dimensioning of Routing Nodes in Delay-Tolerant Networks." IEEE Day Celebrations, Indian Institute of Space Science and Technologies, Trivandrum, 13 October 2017.
- **V. R. Badarla:** "Software Defined Networking." IIT Mandi, 3 October 2017.
- **V. R. Badarla:** "The Issues of PhD Students - Supervisor's Perspective." NIT Trichy, 27 December 2017.
- **Y. Kalidas:** "Artificial intelligence algorithms and Applications for Bioinformatics." *7th National Seminar on Bioinformatics*, SVIMS, Tirupati, 15 March 2018.
- **Y. Kalidas:** "Artificial Intelligence Applications in Biomedical Image Processing and Hands on Workshop." *ICMR-sponsored National Workshop on Bio-Medical Imaging and Analysis with Deep Learning Techniques*, SVCE, Tirupati, 6 March 2018.
- **Y. Kalidas:** "Introduction to Artificial Intelligence Algorithms and Research Topics." *Cynosure Technical Symposium*, Sri Venkateswara University, Tirupati, 9 March 2018.

Electrical Engineering

- **K. P. Naveen:** "Coexistence of LTE-Unlicensed and WiFi: An Auction Theoretic Approach" 1st UK-India DST-UKIERI Workshop on 5G and beyond Wireless Networks, Indore, 05 January 2018.
- **R. K. Sai S. Gorthi:** "Artificial Neural Networks." Chadalawada Ramanamma Engineering College, Tirupati, 12 March 2018.
- **R. K. Sai S. Gorthi:** "Non-Destructive Evaluation of Concrete through Ultrasonic Array-based Imaging. "Luigia Binda Memorial Workshop on *Non-Destructive Testing and Safety Assessment of RC and Masonry Structures,* RILEM Week, IIT Madras, Chennai, 3-8September 2017.
- **R. K. Sai S. Gorthi:** "Recent Trends in Medical Image Analysis and Pattern Classification." Two days' workshop on *The Modalities and Analysis of Medical Images,* Sree Vidyanikethan Engineering College, Tirupati, 23 February 2018**.**

Mechanical Engineering

- **E. Anil Kumar:** "Effective Thermal Conductivity of Metal Hydride Beds: Measurement, Simulation and Augmentation." *HYDROGENIUS and I²CNER Thermal Science and Engineering Division Joint Research Symposium*, Kyushu University, Fukuoka, Japan, 2 February 2018.

- **E. Anil Kumar:** "Metal Hydrides for Hydrogen Storage and Related Applications." Preconference Workshop on Hydrogen Storage as a part of *6th International Conference on Advances in Energy Research*, IIT Bombay, Mumbai, 11 December 2017.

Physics

- **R. S. Manna:** "Low-dimensional Frustrated Quantum Magnets in Triangular and Honeycomb Lattices." Indian Association of Cultivation Science (IACS), 18 December, 2017.

Mathematics

- **I. Das:** "Statistics in Real Life: Predict Your Happiness." on the occasion of the *Birthday Celebration of the Father of Modern Statistics Prof. R. A. Fisher*, Department of Statistics, Sri Venkateswara University, Tirupati, 17 February 2018.
- **S. Anurag Prasad:** "Stability of Coalescence Hidden-Variable Fractal Interpolation Surface." National Mathematics Day, Department of Mathematics, Sri Venkateswara University, Tirupati, 22 December 2017.
- **V. Raghavendra:** "Peaons Axioms" and "When all Maps are 1:1 if and only if onto" BITS Pilani, Hyderabad Campus. 14-15 September 2017.

Humanities and Social Sciences

- **A. Raghuramaraju:** "From No Violence to Non-Violence: India's Appropriate Answer to Unique Question Set by British Colonialism." MINDAS, Osaka, Japan, 6 March 2018.
- **A. Raghuramaraju:** "State of Philosophy in India Today." Two days national seminar on *Philosophy: The Eternal Awakener of Humanity*, Department of Philosophy, Osmania University, 29 March 2018.
- **A. Raghuramaraju:** "The Impact of Heliocentric View on the Rise of Anthropocentric View in Humanities." Indian Institute of Science Education and Research, Tirupati, 9 February 2018.
- **A. Raghuramaraju:** "Writing India." *Academic Writing Workshop*, Department of Sociology, University of Hyderabad, 5-9 February 2018.
- **C. S. Bahinipati:** "Introduction to Environmental Economics." Department of Economics, Nayagarh Autonomous College, Odisha, 3 March 2018.
- **C. S. Bahinipati:** "Prof. Chandrasekhran Endowment Lecture on '*The economics of climate change.*'" Department of Economics, Government College Kasargod, Kerala, 15 January 2018.
- **C. S. Bahinipati:** "The Effects of Developmental Interventions on Adaptation Decisions and Farmers' Wellbeing: Evidence from Drought-prone Households in Rural India." FLAME University, Pune, 21 February 2018.
- **P. S. Dwivedi:** "Language, Linguistics and Communication: Towards Understanding the Interrelation, Concomitance, and Simultaneity," Refresher Course in Humanities, HRDC, SV University, Tirupati, 12 January 2018.
- **P. S. Dwivedi:** "Theory of Rasa: A note on Theory and Practice." Refresher Course in Humanities, HRDC, SV University, Tirupati, 13 January 2018.
- **V. Vamshi K. Reddy:** "Cinema as a Text." Refresher Course in Humanities, HRDC, SV University, Tirupati, 12 January 2018.
- **V. Vamshi K. Reddy:** "Cultural Studies as a Discipline." Refresher Course in Humanities, HRDC, SV University, Tirupati, 13 January 2018.

5.4 Projects Sanctioned

- **Abhijit Ganguli:** "Structure Integrated Sensors and Actuators to Monitor and Renew Machine Tool Performance" funded by Ministry of Human Resource Development & Ministry of Heavy Industries, amount sanctioned— Rs. 24 lakhs, March 2017-February 2020.
- **E. Anil Kumar:** "Reversible Alkali Metal Based Hydrides for High Temperature Thermal Energy Storage" funded by Department of Science and Technology, leaded by IIT Tirupati, and Contributed by IIT Bombay, IIT Guwahati, and IIT Indore, amount Sanctioned— Rs. 144.44 Lakh, for a period of three years, March 2018.
- **E. Anil Kumar:** "Design, Development and Demonstration of Indigenous Hydrogen Storage and Fuel Cell System for Mobile and Stationary Applications of 5 KW Capacity" funded by Department of Science and Technology, MHRD, and MNRE, led by IIT Bombay, Contributed by IIT Tirupati, IIT Guwahati, and IIT Ropar, amount sanctioned— Rs. 400 Lakh, for three years, December 2017.
- **Arun K. Manna:** "Modeling High-throughput Materials for Optoelectronic and Charge Transport Applications: Towards Better Solar Cells" funded by DST INSPIRE Faculty Program, amount sanctioned-– Rs. 35 lakhs, duration-– April 2017-March2022.
- **B. Koteswararao:** "Investigations of Quantum Spin Liquids and Multiferroics in Geometrically Frustrated Magnets" funded by DST Inspire Faculty Program, amount sanctioned— Rs. 35 Lakhs, 21 January 2015 - 20 January, 2020. (Note: It is a transferred project from University of Hyderabad to IIT Tirupati with effect from, 3 July 2017.

5.5 Awards & Achievements

- **K. P. Biligiri:** Lead Guest Editor, Special Issue in Journal of Testing and Evaluation, American Society for Testing and Materials International, USA, October 2017 – Present.
- **S. Chimalakonda:** Associate Editor, IEEE Software Blog, Software Quality & Software Reuse.
- **D. P. Challa:** Awarded with DST SERB MATRICS (Mathematical Research Impact Centric Support) on "Wave Propagation by Small Inhomogeneities: Applications to Medical Imaging, Effective medium theory and the theory of Meta-materials" for a period of three years, December 2017.
- **A. Raghuramraju:** Interview by Richard Marshall, for 3: Am Magazine, *Ramchandra Gandhi and Contemporary Indian Philosophy*, 24 February 2018.

5.6 Membership of Professional Bodies

- **K. P. Biligiri:** Academic Member, Academy of Pavement Science and Engineering October 2017 – Present.
- **K. P. Biligiri:** International Member, Committee AFK50, Standing Committee on Structural Requirements of Asphalt Mixtures, Transportation Research Board of the National Academies, Washington, DC., USA, March 2018 – 2021.
- **K. P. Biligiri:** Member, American Society of Civil Engineers, January 2018 – Present.
- **K. P. Biligiri:** Member, RILEM, International Union of Laboratories and Experts in Construction Materials, Systems and Structures, France, September 2017 – Present.
- **S. Chimalakonda:** Associate Editor, IEEE Software Blog, Software Quality & Software Reuse, July 2017.

5.7 Extension/Extracurricular Activities

- **S. M. Maliyekkal:** External examiner for conducting the Viva- Voce Examination for M. Tech. Environmental Engineering students, NIT Trichy, 11 January 2018.
- **S. M. Maliyekkal:** Member of Departmental Advisory Committee, Department of Civil Engineering, Kuppam Engineering College (KEC), 7 December 2017.
- **V. Badarla, Dr. Y. Kalidas,** and **S. Chimalakonda:** *What Makes Computer Science Exciting?* An interactive session with around 50 Navodaya school students at IIT Tirupati, on 29 January 2018.
- **S. Chimalakonda:** Is a part of Core Committee, ACM iSIGCSE, Special Interest Group in Computer Science Education, October 2017.
- **S. Chimalakonda:** Vice Chair [Social Media & Global Outreach], for ACM SIGSOFT, Special Interest Group in Software Engineering, April 2017.
- **S. Chimalakonda,** and **Y. Kalidas:** Attended *TECH-2011: Digital Pedagogies for Building Peaceful and Sustainable Societies,* Visakhapatnam, 16-18 December 2017.
- **R. K. Sai S. Gorthi:** Reviewer for a PhD Thesis work at IISc**, "**Design, Development, Deployment and Performance Evaluation of Pyroelectric Infra-Red and Optical Camera based Intrusion Detection Systems in an Outdoor Setting" from ECE department.
- **R. K. Sai S. Gorthi:** External Examiner for final M.Tech Thesis Evaluations at IIST**,** for "Machine Learning and Computing" stream.
- **R. K. Sai S. Gorthi:** Reviewer for IEEE Transactions on Geoscience and Remote Sensing, Pattern Recognition Letters, Elsevier, IEEE Access, IEEE Sensor Journal, Applied Optics.
- **R. K. Sai S. Gorthi:** Reviewer for SPCOM conference, March 2018.
- **Durga Prasad Challa:** Visiting researcher at Inverse Problems Group, Radon Institute (RICAM), Linz, Austria, date June 2017.
- **A. Raghuramraju:** Member of Ethics Committee, IISER, Tirupati, March 2018 – February 2019.
- **Chandra Sekhar Bahinipati:** Reviewer for 15th International Globelics Conference, Athens, Greece, 11-13 October 2017.
- **Chandra Sekhar Bahinipati:** Member of Doctoral Advisory Committee, Ashoka Trust for Research in Ecology & Environment, Bengaluru, 27 September 2017.

6.

MoUs Signed by IIT Tirupati

MoUs and academic associations with the universities, research institutes and laboratories, and industry of international repute are prioritised to nurture the collaborative academic and research activities. IIT Tirupati has inked Memorandums of Understanding with a number of institutions in India and abroad that aims to uphold institutional collaborations of mutual interest at various levels such as exchange visits of faculty, students, and research staff, joint conferences and workshops, and student internships.

Nagaoka University of Technology, Japan

IIT Tirupati, and the Department of Mechanical Engineering and Department of Nuclear System Safety Engineering, Nagaoka University of Technology (NUT), Japan, signed a Memorandum of Understanding (MoU) to improve mutual understanding between the two institutions by contributing to the advancement of academic and research activities in the areas of mutual interest on January 24, 2018. The MoU aims to promote academic and educational collaboration, and exchange of students, academic and research staff between the two institutions.

VENUSGEO/7IQ

IIT Tirupati signed an MoU on February 07, 2018 with Venusgeo/7iq for setting up a Centre for Excellence (CoE) for Product Engineering and IoT, with application to some of the major focus areas that the Institute has identified including smart infrastructure, energy, food science and engineering. This CoE will train the students to design, develop and manufacture products in the IoT domain.

R&B Department, Government of Andhra Pradesh

IIT Tirupati entered into an MoU with Roads & Buildings (R&B) Department, Government of Andhra Pradesh, on March 15, 2018 chiefly to promote interaction between R&B Department and IIT Tirupati in mutually beneficial areas of transportation infrastructure, and to enhance research and development interests between R&B Department and IIT Tirupati. The principal areas of collaboration will include, but not limited to: sustainable roadway infrastructure and systems engineering.

7. Academic Events

IIT Tirupati organised one national level workshop, and one conference, so as to facilitate the interaction of the faculty members and students of the Institute with the scholars from all over India. Further, for the benefit of IIT Tirupati fraternity, the Institute also organised a 3-day Residential Training Programme. The Institute organised an orientation programme for providing an overview of the Institute and the curriculum for the second batch of students at the onset of new academic year.

7.1 Academic Orientation Programme

The Institute conducted its 3rd Orientation Programme on 31 July 2017 to induct the 2017-2021 batch of B. Tech students. The students and their parents were briefed about the academic programme and the facilities available at IIT Tirupati. It was followed by an interactive session for the parents with the Director and Deans of the Institute.

Dean Academic Affairs addressing the students and their parents

7.2 Faculty Development Programme

IIT Tirupati, with the support of MHRD, organised a Faculty Development Programme from December 3 to 6, 2017. The programme was inaugurated, and commenced by Prof. Rajeev Sanghal (Director, IIT BHU), and was conducted by Prof. Pradeep K. Ramancharla (IIIT Hyderabad). The workshop witnessed the participation of faculty members from other newer IITs like Palakkad, Goa, Bhilai, Dharwad, along with faculty from IISER Tirupati, NIT Surathkal, and other Universities.

Prof. Rajeev Sanghal (Director, IIT BHU) delivering the inaugural lecture at the Faculty Development Programme

7.3 Workshops, Conferences and Symposium Organised

Workshop on Functional Analysis

Prof. V. Raghavendra addressing the participants of the workshop

The Department of Mathematics, IIT Tirupati, organised a workshop on "Advanced Training School on Functional Analysis for Teachers and Research Scholars" in collaboration with the 'National Board for Higher Mathematics' on 11-23 December 2017. Many renowned faculty were invited for their lectures and talks. Prof. S. H. Kulkarni, Prof. P. Veeramani, and Prof. M. Thamban Nair from IIT Madras; Prof. K. Parthasarathy from Ramanujan Institute of Advanced Study in Mathematics, University of Madras; Prof. S. Kesavan from The Institute of Mathematical Sciences, Chennai; and Dr. D. Sukumar from IIT Hyderabad delivered lectures on important topics in the area of functional analysis. Prof. V. Raghavendra and Dr. S. Rajesh from IIT Tirupati also delivered a few lectures.

7th Topical Conference of the ISAMP

IIT Tirupati and IISER Tirupati jointly hosted the 7th Topical Conference of the Indian Society for Atomic and Molecular Physics between 6 and 8 January, on the theme, "Quantum Collisions and Confinement of Atomic and Molecular Species and Photons". Around 125 delegates attended the conference from India and abroad. The sessions were held both at IIT Tirupati and IISER Tirupati.

Prof. P. C. Deshmukh addressing the participants of the conference

7.4 Colloquium /Invited Talks

The Institute, for the benefit of its faculty and students, invites scholars from across the world for delivering special talks on various topics. A list of such invited talks is given below:

- **Prof. J. N. Reddy,** Regents Professor of Mechanical Engineering in Texas A&M University, delivered a talk on "Numerical Simulations in Engineering: The Third Scientific Methodology" on 8 August 2017.

Prof. J. N. Reddy giving a talk

- **Prof. Rani Sadasiva Murty,** Professor at Rashtriya Sanskrit Vidyapeeth, Tirupati, delivered a special lecture on "Management Ethos – Ancient Indian Knowledge Perspective" on 9 August 2017.
- **Chaza Makki,** Bachelor of Arts, International Relations, & **Elisa Geremia,** Bachelor of Communication, Public Relations, from the University of Texas, Austin, conducted a talk about their "Internship with XLr8AP, Global Technology Business Accelerator - Educational, Cultural and Entrepreneurial perspective" on 16 August 2017.
- **Dr. Balaji Subramanian** from University of California, Santa Barbara (UCSB) delivered a talk on "Drone Based Experimental Investigation of Flow around Multi-MW Wind Farms in Flat and Complex Terrains" on 28 August 2017.
- **Mr. S. Sankar Raj,** A Certified Ethical Hacker from Prompt Infotech, delivered a talk on "Digital India Awareness Program" on 30 August 2017.
- **Dr. Paventhan Arumugam,** Additional Director (R&D) with ERNET India, delivered a talk on "Emerging IoT Open Standards & Protocols" on 9 September 2017.
- **Mr. M. Desanna,** A Senior Research Staff in Central Research Laboratory (CRL), Bharat Electronics (BEL), Bangalore, delivered a talk on "Introduction to Tactical Communication Systems" on 11 October 2017.
- **Prof. A. Raghuramaraju,** Department of Philosophy, University of Hyderabad and Visiting Professor at Department of Humanities and Social Sciences, IIT Tirupati, delivered a talk on "The Idea of Mahatma: Imperialism to Independence" on 15 November 2017.
- **Prof. Muddappa Seetharama Gowda,** Department of Mathematics and Statistics, University of Maryland, Baltimore County gave a special lecture on "Finite Dimensional Variational Inequalities and Complementarity Problems and Applications" on 30 November 2017.

Chaza Makki, and Elisa Geremia discussing about their Internship with XLr8AP

- **Prof. Suman Chakraborty,** Mechanical Engineering, IIT Kharagpur, delivered a lecture on "Microfluidics for Healthcare" on 24 January 2018.
- **Prof. J. Sethuraman,** Department of Statistics, Florida University, delivered a talk on "Start-Over-After-Pre-empts (SOAP) Repair" on 1 February 2018.
- **Prof. K. Srinivasa Rao,** the first Distinguished DST-Ramanujan Professor of Mathematical Sciences at Srinivasa Ramanujan Centre, Sastra University, Thanjavur, delivered a talk on "Raman and Ramanujan" for the National Science Day celebrations, on 1 March 2018.
- **Prof. Biswa Datta,** Distinguished Research Professor, Northern Illinois University, Illinois, USA, delivered a talk on "Computational and Optimisation Methods for Quadratic Inverse Eigenvalue Problems Arising in Mechanical Vibration and Structural Dynamics: Linking Mathematics to Industry" on 18 January 2018.
- **Prof. S. Lakshmivaahan,** George Lynn Cross Research Professor, Computer Science, University of Oklahoma, USA, delivered a talk on "Data Mining, Data Assimilation and Prediction - Parts of a Continuum" on 24 January 2018.

- **Prof. S. Mohan,** Centre for Nano Science & Engineering (CeNSE), IISc Bangalore, interacted with the faculty members on "CeNSE facilities at IISc Bangalore, and how can IITT faculty members be associated with the Centre for their research" on 21 February 2018.

7.5 Industrial and Field Visits

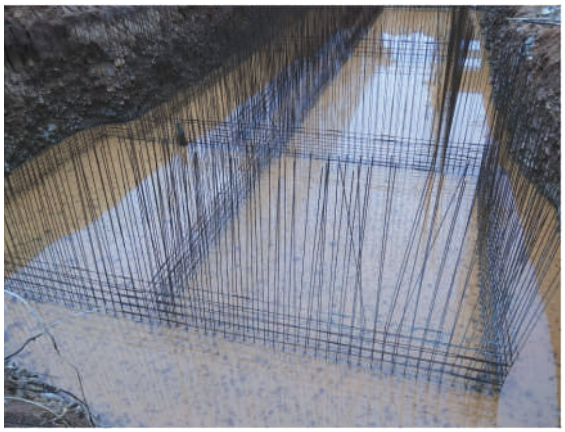
Visit to ISUZU & DANIELI

The students of 3rd Year, Mechanical Engineering, visited two companies, ISUZU & DANIELI, Sri City, on 6 March 2018. DANIELI India Ltd is a steel equipment manufacturing industry that produces machinery and spare parts. The students got a close look at some of the important operations that go into the fabrication, machining and assembly of massive and complex machine parts.

ISUZU Motors India Pvt. Ltd. is a renowned manufacturer of automobiles (AUVs). The students visited their assembly section and listened to a brief talk about the history of ISUZU Motors India Ltd. and the various products manufactured by the industry along the years to the present.

Visit to an Under Construction Hospital

The students of 2nd year, Civil Engineering, visited an eye hospital (under construction) on NH 71, Tirupati, on 19 August 2017, to get exposure to the basics of sub-structure and types of the foundations.



Airport Visit

The students of 3rd year, Civil Engineering, along with faculty members Dr. Janaki Ramaiah and Dr. B. Krishna Prapoorna, visited Tirupati International Airport on 3 November 2017. The students learned about different facilities available at the airport and its functioning. Students also visited the Air Traffic Control room.

IITT students in Air Traffic Control room of Tirupati Airport

Visit to Polavaram Project Site

The students of 3rd year, Civil Engineering, along with the faculty members Dr. Janaki Ramaiah and Dr. Prasanna V. Sampath, visited the Polavaram Dam Project site, near Rajahmundry on 2 December 2017. This visit provided the students an opportunity to understand various geotechnical challenges posed by the subsoil conditions, and the methodologies /techniques adopted by the engineers to tackle those challenges using state-of-the-art heavy equipment. Further, the students visited the facilities under construction at the project site, viz., the cut-off-wall construction, densification of the sand using the Vibrocompaction technique and Cone Penetration Test (CPT) with measurement of pore pressure at the site.

IITT students at Polavaram Project Site

Visit to Railway Station

The students of 3rd year, Civil Engineering, along with the faculty members, Dr. B. Krishna Prapoorna and Dr. Janaki Ramaiah, visited Renigunta Railway Station on 12 February 2018. This was a field trip organized as a part of course Transportation Engineering-II.

Visit to Water Treatment Plant

The students of 3rd year, Civil Engineering, along with the faculty member Dr. Shihabudheen M. Maliyekkal, visited Water Treatment Plant at Chembarambakkam, Chennai, on 17 February 2018. The students visited the facilities at the WTP, viz., Aeration System Chlorination Tank, Pulsator Clarifiers, Sedimentation Tanks, Sand Beds for Filtration, Sludge Thickeners, Treated Water Storage Tanks and Pump Hose for pumping treated water.

Water Treatment Plant, Chembarambakkam, Chennai

Visit to Sewage Treatment Plant

The 3rdyear students of Civil Engineering, along with the faculty members, Dr. Shihabudheen M. Maliyekkal, visited the Sewage Treatment Plant at Nesapakkam, Chennai, on 17 February 2018. They saw the following components of the plant and tried to understand their functioning:

- Screen Chamber
- Grit Chamber
- Primary Clarifier
- Aeration Tank
- Secondary Clarifier
- Chlorine Contact Tank
- Sludge Thickener
- Digester
- Centrifuge and Power Generator from Biogas

It was an enriching experience for them in terms of an exposure to on-site working of a sewage treatment plant and its various components.

Sewage Treatment Plant, Nesapakkam, Chennai

8. Institute Events

IIT Tirupati organised various on-campus events to give the students ample opportunity to develop their overall personalities along with expertise in their respective branches. In the third year of its inception, the Institute witnessed larger Institute events in terms of variety and significance. The Institute organised and hosted a Faculty Development Programme giving opportunity to the faculty members of more than five IITs along with prestigious engineering institutions from different states to learn from experts of international repute. Further, the Institute organised the first performance of SPICMACAY on campus. This section of the report details about the various events organised by the Institute during the year 2017-2018.

Second Institute Day

IIT Tirupati celebrated its second Institute Day on April 7, 2017 with Prof. V. S. Raju (Former Director, IIT Delhi) as the Chief Guest. The event was presided over by the Director. Prizes were given to the meritorious students, and the event ended with memorable cultural performances by the students. Students enthusiastically organised various cultural programmes and prizes were distributed. Vote of thanks, in the end was proposed by Prof. K. Krishnaiah.

A view of students cultural programmes and prize distribution

Independence Day

IIT Tirupati fervently celebrated the Independence Day. The celebrations commenced with a march past by the students followed by flag hoisting by the Director and National Anthem. The Director then addressed the students, faculty and staff and underlined the vision behind setting up the IITs and their role in the thriving economy of the nation. Cultural programmes in the auditorium started with Saraswati Vandana. The 3rd year Students performed a satirical skit on the theme of corruption. Abhivyakti (Idea presentation) brought faculty members and students on the dais to express their views about various issues of the national interest. The programme concluded after the vote of thanks proposed by Pranjal Shukla, Student Secretary, Academic Affairs.

A few clicks of cultural programme held on Independence Day

Teachers' Day Celebration

Like every year, IIT Tirupati marked 5th of September by celebrating Teachers' Day commemorating the birth anniversary of Professor S. Radhakrishnan. The event was graced by the presence of Prof. P. S. Rao (Former Dean, IIT Madras) who shared his vast academic experience with the faculty and students of IIT Tirupati. The event was concluded by felicitation of Prof. P. S. Rao by the Director.

Director, IIT Tirupati welcoming Prof. P. S. Rao

Vigilance Awareness Week

IIT Tirupati observed Vigilance Awareness Week from October 30 to November 4, 2017 by conducting various activities like essay writing and poster making competitions, special lecture and Unity Run. The special lecture was delivered by Shri A. Ravi Krishna (IPS), Chief Vigilance and Security Officer, TTD on the theme “My Vision - Corruption Free India.”

Shri A. Ravi Krishna (IPS) delivering a talk

Run for Unity - 2017

Indian Institute of Technology Tirupati observed Rashtriya Ekta Diwas (National Unity Day) on 31st October 2017 to honour the birth anniversary of Sardar Vallabhbhai Patel by conducting various events that reflected decisive efforts in unifying a diverse country like India. Run for Unity was organised by the Institute on 5th November 2017 from Ramanuja Circle to IIT Tirupati Temporary Campus. Prof. K. N. Satyanarayana, Director, IIT Tirupati flagged off the Run along with Mr. Hari Kiran, Municipal Commissioner Tirupati and Prof. T. S. Natarajan, Registrar, IIT Tirupati. The Director addressed the enthusiastic gathering and invited everyone to join hands to strengthen the ideals of Sardar Patel. He opined that India is the only country where unity prevails in diversity and he further stressed that we should strive to convert the dreams of Sardar Patel into reality by overcoming various difficulties at the levels of region, language, caste and religion. Mr. Hari Kiran expressed his joy on witnessing true colours of Unity in Diversity in IIT Tirupati where the students are from across the country.

Unity Run being flagged off by the Director and the Municipal Commissioner, Tirupati

Republic Day Celebrations

IITT celebrated the 69th Republic Day on January 26, 2018. The celebrations began with unfurling of the national flag by the Director Prof K. N. Satyanarayana followed by the National Anthem. The Director addressed the gathering of the faculty, staff and students. Students organised many cultural events pledging to the national unity and love for the country.

Director, IITT unfurling the national flag

International Yoga Day Celebrations

June 21st, 2017 was celebrated as the International Day of Yoga at IIT Tirupati with great fervour. Mr. Jampala Srinivasa Rao, a Yoga teacher, was invited to deliver a talk on Yoga, and instruct the faculty and staff members to practice different asanas correctly. Following the instructor all the members of faculty and staff were performing different asanas along with being introduced to the benefits of those yogasanas. Yoga instructor Mr. Jampala Srinivasa Rao through his talk and demonstration motivated the faculty and students to pick up this healthy habit.

Digital India Awareness Programme

Prompt Infotech organised Prime Minister's "Digital India Awareness Program" at IIT Tirupati on 30th August, 2018. This session was presented by Prompt Infotech's resource person S. Sankar Raj, a certified ethical hacker (CEH) with 10 years of experience in this field and who has worked abroad extensively in network security & cyber forensics. He was involved in solving critical cyber-crime issues involving Central Bureau of Investigation and Indian Police Department.

9. Campus Infrastructure

IIT Tirupati, since its inception, has been adding new infrastructure facilities to its temporary campus to meet the essential needs of the students as and when required. In order to meet the additional space requirement, the Institute took another building adjacent to the existing one on rent to accommodate the increasing number of research scholars and faculty members. IIT Tirupati, in the third year itself of operations, is set to move to its 530 acres permanent campus located in Merlapaka Village on Yerpedu-Venkatagiri Highway, where in an area of 30 acres the transit campus has come up. The transit campus is designed in such a way that it will be integrated with the master plan of the permanent campus after serving its immediate purpose. This chapter reports about the progress made in the campuses of the Institute during the period under consideration.

9.1 Temporary Campus

Academic Building

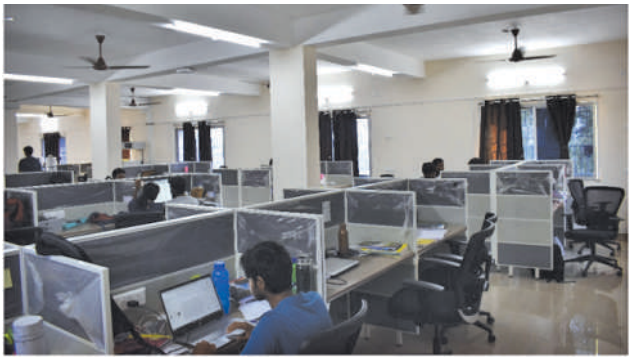
IIT Tirupati began functioning from its temporary campus situated on the Tirupati–Renigunta road in the premises of Krishna Teja Group of Institutions. Within a short span of time, the Institute created all the necessary infrastructure at its temporary campus to ensure the smooth functioning. The Institute also created a kitchen-cum-dining facility on its temporary campus within the record time of 45 days using PEB structures. Following are the facilities that are available on the temporary campus:

A view of the temporary campus, IIT Tirupati

- Auditorium - 200 Seater
- National Knowledge Network (NKN) Virtual Classroom
- 30 Seater Class room - 2 nos.
- 60 Seater Class room - 8 nos.
- 120 Seater Class room - 1 no.
- Faculty Cabins and Lounge
- Guest Faculty room
- Staff room
- Research Scholars room
- Meeting rooms
- Board room
- Centralised Wi-Fi
- Administration Office

- Electronics Laboratory
- Physics Laboratory
- Chemistry Laboratory
- Workshop Computer Laboratory
- Innovation Laboratory
- Kitchen-cum-Dining Facility
- Cafeteria
- Gymnasium
- Passenger Lift
- 24x7 – 365 days DG Backup for entire campus
- RO system (2x500 Litres per hour)- For the purpose of drinking and cooking
- Outdoor and Indoor sports facilities
- Necessary facilities have been created for providing access to the physically challenged

A view of the Annexe Building



A view of the cubicles for Research Scholars

Annexe Building

In order to meet the additional space requirement due to increase in the strength of faculty members and research scholars, the Institute hired another G+2-floor building measuring an area of 10,000 sqft (approx.) close to the existing academic building.

The annexe building is also equipped with the facilities required for the faculty chambers and cabins for the research scholars. A total of 60 individual cubicles were created for MS and PhD students to facilitate dedicated reading and research.

Student Hostels & Other Facilities

IIT Tirupati hired four buildings to offer hostel accommodation to the students of all the three years. To ensure comfortable living at the hostels, the Institute created all the required facilities at each hostel individually, and provided the students with well-furnished rooms along with dining facility. The Institute has also signed an MoU with a multispecialty hospital in the town to provide students with cashless treatment.

Hostel at IISER Tirupati

Boys' Hostel at Alipari

Boys' Hostels at Lakhsmipuram Colony

Girls' Hostels at Lakhsmipuram Colony

Accommodation and Transportation

Students were given accommodation in four different hostels. The first-year girls and boys were housed in the hostel located on the campus of IISER Tirupati. 21st Century Gurukulam Hostel was taken on rent by the Institute from Sri Venkateswara University and the second-year boys were housed there. The third-year boys' hostel, and the second and the third-year girls' hostel are in the buildings hired in the vicinity of temporary campus at Lakshmipuram Colony.

Transport facility has also been arranged by the Institute for the students to commute between the hostels and the Institute. The hostels have 24x7 Wi-Fi facility connected through point-to-point radio from the main building of the Institute, washing machines, TV, water coolers, water heaters, and computer rooms.

The construction of three hostels in the permanent campus, each to accommodate about 150 students along with all the state-of-the-art facilities, is to be completed by July 2018. An indoor stadium along with outdoor sports facilities is also getting ready for the students. The Institute, from July 2018, will be providing accommodation to all the male students on the campus.

Medical Facilities

The Institute signed MoU with Sri Ramadevi Multispeciality Hospital, Tirupati, to provide

medical facilities to its students, faculty and staff. Also, a doctor from the aforementioned hospital visits the Institute daily to provide in-house consultation to all its students, faculty and staff members.

Guest House Facility

To cater to the increasing need of the guest house, the Institute hired one more apartment in KCR Tower apartment complex, to add to the four apartments currently under use. For the purpose, 10 double occupancy and 3 single occupancy air-conditioned rooms with Wi-Fi and other required facilities are made available for the guests of the Institute. The guest house has a centralised kitchen-cum-dining hall. Apart from the above, two fully furnished apartments are made available to the visiting faculty.

Guest house facility at KCR Towers

9.2 Permanent Campus

The Government of Andhra Pradesh provided land to the Institute to an extent of 530.49 acres for the development of the permanent campus located on the Yerpedu–Venkatagiri Highway in Merlapaka Village. The permanent campus site is 24 km from Tirupati town, 14 km from Renigunta Railway Station and 13 km from the Tirupati Airport. The construction of the compound wall around the site is nearing completion.

With the due approval of the mentor Director, a Campus Master Plan Advisory Committee was constituted in March 2016 for the selection of Master Planner and Architect Agency. The committee, following the due selection process, appointed M/s Suresh Goel & Associates as consultant for the campus master plan, design of academic buildings, and design of external services in September 2017. For the design of residential buildings and sports facilities, M/s Adarshila Designs Pvt. Ltd has been appointed.

The Master Plan, for the 12,000-student campus, has been completed. It includes four zones, namely, Academic Zone, Hostel Zone, Housing Zone, and Recreational Zone, along with a transit campus (that will later be integrated with the permanent campus) as shown in the figure below:

Master Plan, IIT Tirupati

Salient features of the Master Plan:

- The site is bifurcated by a national highway. The west campus (511 acres) will house the academic campus and the east campus (19 acres) will house a research park. An underpass will connect the two campuses.
- The campus is planned as smart, sustainable, and pedestrian friendly campus.
- To maintain the ecological features of the campus site, the existing rivelets and water bodies are being retained. In order to preserve the ecology of the permanent campus site, a detailed Ecological Management Plan (EMP) was prepared by Care Earth Trust, a Chennai based NGO.
- Two water bodies are being created for capture and storage of run off. This will cater to about 3 months of water supply for the campus.
- The locations of the buildings and other facilities are planned to minimise the cuts and fills in the site.
- The buildings are oriented to minimise heat gain.

It has been planned that the permanent campus would be built in phases. A complete campus to cater to 2,500 students, 250 faculty members and 275 staff members is planned to be built by 2024. The construction is to be taken up in two stages. In Stage 1, to be completed by 2020, buildings and facilities to cater to 1250 students and 120 faculty members are to be completed and all operations are to be moved to the permanent campus. Subsequently, the campus is to be developed in various phases growing over a period of 25-30 years to cater to a 12,000-student campus.

9.3 Transit Campus

IIT Tirupati, in its third year of operations, is set to move to its 530 acres Permanent Campus located in Merlapaka Village on Yerpedu-Venkatagiri Highway. In order to meet the immediate requirements of the Institute, a Transit Campus, to be integrated in the master plan of the Permanent Campus, has been built in an area of 30 acres within a span of one year adopting fast track and sustainable construction technologies. The construction work of the transit campus was entrusted to CPWD as deposit work. The contract for construction of transit campus was awarded to Amara Raja Infra Pvt. Ltd. by CPWD. The transit campus is expected to be operational by July 2018.

The buildings and facilities on the transit campus include:

- Five hostels with G+3 floors, each to accommodate about 150 students
- A G+1 floor classroom complex with a 120-seater studio type classroom, a 90-seater class room, a 60 – seater classroom, a 90-seater Computer Science laboratory, one staff room, and a Health Centre with two medical examination rooms and 4-bed ward
- Two laboratory buildings to house Civil, Electrical, and Mechanical Engineering laboratories and workshop facilities
- Residential block with four apartments for essential staff
- A maintenance office building
- An indoor sports complex along with outdoor sports facilities
- A dining-cum-kitchen facility for 300 persons in a batch, equipped with modern and hygienic kitchen
- BT roads with street lighting
- 500 kVA sub-station

The construction of transit campus includes following sustainable Eco-Friendly features:

1. Glass Fibre Reinforced Gypsum (GFRG) technology in the construction of hostels, and residential blocks
2. PEB structures for laboratories, workshop, dining block, indoor sports complex
3. Polished concrete flooring in the laboratories
4. 220 kWp roof-top grid interactive type solar power plant
5. Solar water heaters
6. 48-volt DC light fittings and ceiling fans in hostels
7. High Volume Low Speed (HVLS) fans
8. STP with treated water used for flushing and gardening purposes

10. Student Activities

In addition to their regular course of affairs, the students at IIT Tirupati are very actively engaged in organising various technical, cultural, and sports activities that shape their innovative thinking and enhance their multidimensional talent. The Institute has fostered around ten active clubs on academics, photography, music, drama, dance, trekking, volunteering social services etc. This section of the report summarises following events and activities organised by the students:

(a) Technical and Techno-Cultural events

(b) NSS activities

(c) Student clubs and sports related activities

10.1 Technical Events

The following are the technical events organised in the year 2017-2018:

Inter-IIT Tech Meet– 2018

IIT Tirupati participated in the 6th Inter-IIT Tech-Meet that took place at IIT Madras and was concluded on 7th January 2018. The Institute secured 10th position in the Overall General Championship out of the participating 18 IITs. A contingent of 18 members from IIT Tirupati participated in five different challenging problems.

India Innovation Challenge– 2018

Four teams from IIT Tirupati qualified for the quarter final stage in India Innovation Challenge and Design contest conducted by DST in collaboration with Texas Instruments.

ACM ICPC – 2018

Two teams from IIT Tirupati qualified for the pre-final round in ACM International Collegiate Programming Contest. An ACM Student Chapter is initiated to support coding culture at the institute.

Team IIT Tirupati at ACM

Smart India Hackathon - 2018

Smart India Hackathon or SIH 2018 was organised by All India Council for Technical Education (AICTE) under the aegis of Ministry of Human Resource Development (MHRD). Its finale was held in March 2018. In total, from IIT Tirupati, 19 submissions were made to Smart India Hackathon 2018 in both Hardware and Software categories, out of which five submissions in Hardware went to the second round and one submission in (Software) made it to the final.

On-Campus Events

Every semester, there are held a series of technical events which requires both software and hardware skills like coding competition, RC car racing and quizzes on topic like astronomy and technology and also student workshop to enable peer learning.

Mini CEA

Civil Engineering Association (CEA), IIT Madras conducted a *Mini CEA* session for the students of the Dept. of Civil Engineering of the Institute, and other Engineering Colleges on 7 October 2017. It was conducted as a workshop helping students from IIT Tirupati and outside gain a hands-on experience regarding the technical details that are involved in a construction process.

10.2 Tirutsava: the First Techno-cultural FEST

Tirutsava 2018, the first ever techno-cultural festival of IIT Tirupati was held from March 2-4, 2018. An entwined relation of technology and culture, the festival saw a medley of events, ranging from verticals in cultural arts to those in engineering and technology. Accompanying it were special lectures by recognized in-field individuals and educational workshops.

The festival witnessed students' participation in large numbers from various institutes across the city of Tirupati and outside. The initiative of organising something at this big scale was for the most part student-driven along with a team of

Students performing at Tirutsava '18

faculty members to mentor. Through out the three days, a mix of activities were conducted. Technical events were a big success as a multitude of creative and innovative events brought a good inflow of ideas from the students. Alongside, a number of cultural and literary events, indulging in various forms of fine arts and literature were a part of the program. Tirutsava manifested as a wholesome learning experience with its special lectures and workshops. Dr. Serge Haroche, winner of the 2012 Nobel Prize in Physics, addressed the audience on Quantum Computing in a video conference. Dr. Srinivas Padmanabhuni, Mr. Sudhakar Godithi, and Mr. Arun Naniyat provided significant insights to students from their experience and expertise in their respective fields. As part of Tirutsava two robotic events GOLEM TERMINUS (autonomous navigation system design competition) and THE EXPLORER (a line following and a maze solving robot) competition and two coding completion CODE WARS (one on one coding battle) and CODESPRINT (algorithmic coding challenge) and a Technottari (quiz on technology).

10.3 SPICMACAY

The first performance of SPICMACAY to promote the Indian classical music among the youth was organised at IIT Tirupati on March 12, 2018. Smt. Lavanya Ananth, a renowned artiste of Bharatanatyam performed this classical art form explaining the nuances of this classical dance. She was accompanied by Sri Murali Parthasarathy on Vocal, and Nattuvangam, Sri M. Dhananjayan on Mridamgam and Sri. R. Kalaiarasan on Violin.

10.4 National Service Scheme (NSS) Activities

R. K. Model School, Chittoor

NSS student volunteers of the Institute visited R. K. Model School, Chittoor, on the day of Gandhi Jayanti. They interacted with the students of the school, and helped them in learning science through fun experiment demonstrations like magnetic levitation, pouring water without turning bottle, heat energy, musical singing straws etc.

Navajeevan Blind School

Student volunteers of the Institute visited Navajeevan Blind Relief Centre near Tiruchanoor run by a trust and interacted with the students of the school on 5th of October, 2017. They shared their experiences of life skills with those young ones, and spent quality time with them while getting to know about different skills and talents those amazing kids possessed.

Students giving demonstration at Navajeevan Blind School

Swach Bharat Programme

33 NSS Volunteers visited Katrakayala Gunta hamlet of Panguru Gram Panchayat consisting of about 150 households on October 24, 2017. The volunteers began with cleaning the places in the Gram Panchayat, and when people started gathering they narrated them the importance of Swachh Bharat and why it has to be taken up in the villages. The major problem faced today by the villagers is health, and it has become a costly affair too. So, prevention is better than cure. They informed them that most of the diseases caused are due to the lack of hygiene and sanitation. No stagnation of water should be allowed in the surroundings, and no open defecation should be there in the villages. These aspects were explained in detail by the students to the villagers.

Students actively participating in the cleanup drive promoted by Government of India's Swachh Bharat Programme

Interaction with Jangalapalli Villagers

Institute student volunteers went to each house hold of Jangalapalli Village and interacted with the head of the family along with the members to find out the major problems faced by them. Since it was rainy season, most of the villagers were busy with their agricultural activities. In spite of their busy schedule, many cooperated in giving the details about the information required in the UBA survey form.

Tada Falls Clean-up Drive

NSS volunteers of the Institute took up clean-up drive-cum-awareness activity at Tada water falls January 13th, 2018. This initiative by the students help clean-up the area while providing them and the people nearby valuable lessons of cleanliness and hygiene.

Students on their mission to clean Tada Falls

Navajeevan Blind School

The student volunteers took an initiative to collect funds to help in addressing some of the basic needs of the students at the school. The volunteers distributed 100 water bottles and 3 water cans, and also provided them mosquito nets for the windows. These activities not only gave some much needed attention and affection to the children, but also strengthened the emotion of care and compassion in the volunteers.

Pulse Polio Awareness Program

The NSS Unit of IIT Tirupati conducted awareness campaign on Pulse Polio in the adopted villages in Yerpedu Mandal. Polio is a very dangerous disease that may cause paralysis but can be cured through vaccination that is provided free of cost by the Government of India. However, what lacks on most part is lack of awareness and education among illiterate and semi-literate class. This awareness programme by IIT Tirupati students helped play their small contribution in spreading this awareness about both Polio and its vaccination.

NSS volunteers creating pulse polio awareness at Punguru, Katrakayalagunta, Chindepalli villages

Panguru ZP High School

A group of NSS student Volunteers demonstrated science experiments in 8th, 9th and 10th standard classrooms. They made the students familiar with the motto "Learning by Doing" and helped students in cultivating an interest towards Science by demonstrating the applications of the theories that are given in their course book.

"Learning by Doing"

Panguru High School

NSS student volunteers of the Institute visited Panguru High School on February 2, 2018, and interacted with the students and helped them in learning science through fun experiment based demonstrations. This was a class in learning for both the students of High School as well as IIT, as the latter got a very fine first-hand exposure to classroom teaching and management.

Students at Panguru High School

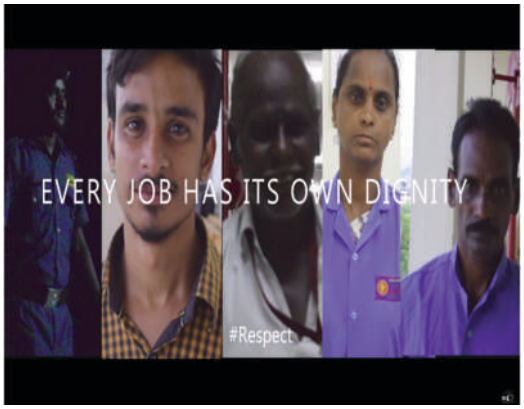
10.5 Student Clubs and Activities

Student clubs and societies play a pivotal role in organising events to extend life beyond the boundaries of textbooks. A number of events were organised by the different clubs and societies of the students during the session 2017-2018.

Actomania

Vanka Sai Sumanth took charge as coordinator from Ms. Shravanthi on 17 September 2018 and formed ACT(Actomania Core Team) with 4 members as core members. The club participated in the Second Inter IIT Cultural Meet held at IIT Kanpur. On 15th August 2017, using the theme, 'Our Nation', some students performed a skit.

Students giving a mime performance



Poster of the short film made by students of IIT Tirupati

Also, auditions were conducted to select students for the different roles in short-film making. The short-film was released on October 9, 2018. It was made within a span of 48 hours with a spectacular heart touching story about the dignity of labour.

A mime on the theme of water wastage and farmers' difficulties were made by students on the occasion of the Republic Day that was liked by everyone, and it gained much popularity and was performed again on Institute Day.

Artista

The art club, which caters to the talents in painting, sketching, craft, is always ready to take up any opportunity to create something beautiful. Canvas painting was conducted on August 15, 2017, in consonance with the Independence Day theme. Paper dressing, glass painting and quilling competitions were also organised as part of other activities of the club.

Students performing in club Artista events

Photography and Film Club (PFC)

The Photography and Film Club of IIT Tirupati extensively organises events throughout the year. Besides photography contests, it also organised a workshop, 'Introduction to DSLR Photography' conducted by Sachin S. Gunthe from IIT Madras. The club has also successfully made an after movie of Tirustava – Techno-Cultural Fest of IIT Tirupati.

Sargam

The music club of IIT Tirupati actively participated in other Institute events, and organised several other events independently. Sargam also organised a Solo and Group Singing Competition. For the first time, IIT Tirupati took part in Inter-IIT Cultural Meet held at IIT Kanpur from December 28 to 31, 2017. In the cultural meet, the club represented the Institute in all the events concerning music.

XCITE

XCITE, the dance club, aims to acquaint the students with the dancing skills and value of dance in their personality development. There are nearly 40 active members in the club. The members perform versatile dance forms like hip-hop, freestyle, Bollywood, folk dance, popping and many more. The students from the club participated in the Inter-IIT Cultural Meet 2017. On the occasion of the Republic day, the club gave two group dance performances that were based on the themes of the love for the nation, and building a secure and safe society for women.

Xcite Club Members performing on Independence day

Freshers' Night

The newcomers were welcomed by the seniors with a series of programmes and contests organised to mark an entire week as Freshers' Week that commenced on August 23, 2017 to finally end at the Freshers' Night on August 30, 2017. Pratik Kumar and Pratyusha Vudutala coordinated the event that had a range of activities in a span of week, before reaching its absolute best at Freshers' Night, which had Halloween as its theme of the evening. The Freshers' Night was organised in a way that it had its fair shares of giggles, sentiments and ecstasy. Two of the freshmen, a boy and a girl respectively, were selected for the title of Mr. Fresher and Miss Fresher, which also marked an end to the event.

A few clicks from Freshers' Night

10.6 Sports Activities

A sports council is central to the coordination and functioning of different sports activities. IIT Tirupati is not at all lagging behind in its sports activities.

Two main sports events took place during the period considered: Inter-IIT and Intra-IIT.

Intra-IIT Sports Event

It was conducted in IIT Tirupati among the different branches of IIT Tirupati, viz., Civil, Mechanical, Electrical and Computer Science engineering. Cricket, Basketball, Volleyball, Chess, Tug of war, Table Tennis were played as a part of the aforementioned event. It built up a lot of motivation and interest among the students for sports activities and also enhanced the sports-culture at the institute which is a prerequisite in order to develop ideas like team work and collective discipline.

Inter-IIT Sports Meet

Students' contingent from IIT Tirupati participated in the 52nd Inter-IIT Sports Meet held at IIT Madras during December 16-23, 2017. The team of IIT Tirupati comprised of 41 members who participated in Cricket (14), Football (15), Badminton (3) and Athletics (9). A number of students gave commendable performances in the event and distinguished themselves. Ms. Sanugula Spandana (1st Year, Civil Engineering) gave a notable performance by securing fourth position in the women's high jump event, with a jump of 1.25 m. The cricket team emerged victorious against IIT Dharwad and marched on to the Pre-quarterfinals, before bowing out against a stronger IIT Kanpur team. Our students took the opportunity offered by the Pan-IIT event to compete and interact with students from all over India with a lot of interest and enthusiasm. Although there were no medals to show for their efforts, our students returned in high spirits and with a greater determination to prove their mettle in future Inter-IIT events.

Director, IIT Tirupati with Students contingent at IIT Madras

IIT Tirupati Students at IIT Madras

24th Inter-IIT Staff Sports Meet

Faculty and Staff members from IIT Tirupati also made their presence visible in sports activities by participating in the 24th Inter-IIT Staff Sports Meet at IIT Madras from December 26 – 30, 2017. This was the first time that IIT Tirupati made its presence felt at this event. There were a number of excellent performances from our staff members – Mr. Chandra Siva Kumar (Badminton), Mr. Senthamilselvan (Cricket), Dr. Shihabudheen Maliyekkal (Athletics), and Mr. Singareddy Anjaneyulu (Athletics).

IIT Tirupati faculty and staff contingent at IIT Madras

MASTER PLAN

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