



वार्षिक प्रतिवेदन Annual Report 2018-19

भारतीय प्रौद्योगिकी संस्थान तिरुपति



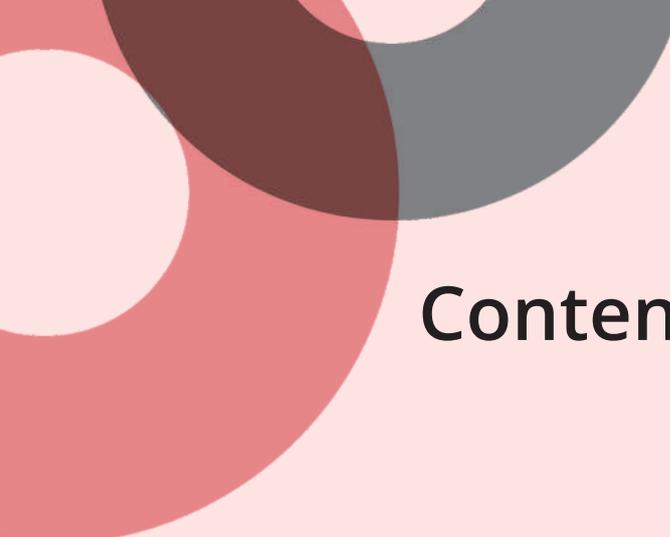
भारतीय प्रौद्योगिकी संस्थान तिरुपति
Indian Institute of Technology Tirupati



The cover features a large, stylized graphic on the left side consisting of two overlapping circles. The top circle is grey and the bottom one is red. The background is a black and white aerial photograph of the Indian Institute of Technology Tirupati campus, showing several multi-story buildings and a road. The text is positioned in the upper right and center-right areas.

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Annual Report
2018-19

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Indian Institute of Technology Tirupati



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Director's Report

Presented at the 1st Convocation of IIT Tirupati on 13 August 2019

Chief Guest, Shri Ramesh Pokhriyal 'Nishank' Ji, Hon'ble Minister of Human Resource Development, Shri R. Subrahmanyam, Chairman, Board of Governors, IIT Tirupati; all the members of the Board of Governors; members of the Senate; graduands and their well-wishers; distinguished invitees; colleagues and students,

It gives me immense pleasure to welcome you all to the first Convocation of the Indian Institute of Technology Tirupati. It is our privilege to have Shri Ramesh Pokhriyal 'Nishank' ji, Hon'ble Minister of Human Resource Development to address our graduating students today and award the medals. The history of IIT Tirupati is in making and in it, the first convocation is an event of paramount significance. On this historical occasion, we are proud to announce that a total of 103 B. Tech and one M. S. degrees will be awarded today.

The establishment of IIT Tirupati was announced in 2014 by the Government of India along with five other new IITs. The foundation stone for the Institute was laid on March 28, 2015 by the then Hon'ble Minister for HRD Smt. Smriti Irani in the presence of Hon'ble Union Ministers Shri M. Venkaiah Naidu and Shri Sujana Chowdary, Hon'ble Chief Minister of AP Shri N. Chandrababu Naidu, Hon'ble HRD Minister of AP Shri Ganta Srinivasa Rao and a galaxy of other dignitaries. The common foundation stone programme for IIT Tirupati, IISER Tirupati and IIIT Sri City was attended by over 20,000 people.

IIT Tirupati launched its academic programme with the support of its mentor Institute, IIT Madras, on August 5, 2015 from a temporary campus situated on Tirupati-Renigunta Road, Tirupati. In the fourth year of its operations, IIT Tirupati has started partly functioning from its 530 acres Permanent Campus located in Merlapaka Village on Yerpedu-Venkatagiri Highway. The construction of the permanent campus is underway and the first phase of the construction is expected to be complete by 2021 that will cater to 1250 students and 120 faculty members. The complete campus to cater to 2,500 students, 250 faculty members and 275 staff members is planned to be built by 2024.

Since the inception of the Institute, we are engaged in recruiting world-class faculty members to teach and carry out cutting-edge research often in collaboration with industry and academic

institutions of international repute. In three rounds of regular recruitment, the Institute has appointed 85 faculty members against the sanctioned strength of 93 faculty members. We are striving to establish one of India's leading environs for innovation and entrepreneurship at our Institute to attract top Indian and global companies to recruit our students and conduct collaborative research. IIT Tirupati is growing to be one of the leading institutions in the country with its ideal of global outlook and local relevance.

I, now, share with you some snapshots of our journey since the inception of the Institute.

Academic Programmes

The Institute started in 2015 by admitting 106 students in the B. Tech programmes in four branches of Engineering, namely, Civil Engineering, Computer Science & Engineering, Electrical Engineering, and Mechanical Engineering. In 2018, the B.Tech programme in Chemical Engineering was started and intake in the B.Tech programme was increased to 180 students. In order to get the research programmes stated in the Institute, MS (by research) and PhD programmes were started in 2017. The M.Tech programmes in Computer Science & Engineering, Electrical Engineering and Mechanical Engineering were started in 2018. The M. Tech programme in three streams of Civil Engineering and MSc (Mathematics & Statistics) have been started this academic year.

The current student strength of 823 includes 582 B.Tech students, 118 M.Tech students, 10 M.Sc students, 32 MS and 81 PhD research students. IIT Tirupati takes pride in mentioning here that the Institute consistently had the highest percentage of female student enrolment (17%) in the B. Tech programme, among all the IITs. We did not have to fill any supernumerary seats to achieve the target of 17% female students in the 2019 admissions.

Academic and Sponsored Research

In spite of the infrastructure constraints of a new Institute, IIT Tirupati faculty members have vigorously been involved in academic and sponsored research. During the last three years, our faculty members and students have published more than 100 papers in reputed national and international journals. Our faculty members have authored five books published by reputed international publishers. They have also presented approximately 200 research papers in national and international conferences.

The faculty members have been granted 29 sponsored research projects amounting to 10.40 crores, and 21 industrial consultancy assignments amounting to Rs. 70 lakhs. These projects have been funded by Ministry of Human Resource Development (MHRD), Department of Science and Technology (DST), Council for Scientific and Industrial Research (CSIR), Science and Engineering Research Board (SERB), Naval Research Board (NRB), Indian Space research Organization (ISRO), Indian Council of Social Science Research (ICSSR), etc. Further, about 20 projects are currently under evaluation with various sponsoring agencies.

The Institute has identified the following thrust areas to undertake inter-disciplinary research:

Smart Infrastructure; Food Technologies & Precision Agriculture; Materials & Manufacturing; Energy; Education Technologies; and Design. These have been identified taking into consideration the national needs, local relevance and global trends.

Academic Distinctions Secured by our Faculty Members

In recognition of their academic achievements, our faculty, staff and students have been bestowed several academic distinctions, honours and awards, and memberships on editorial boards of journals. Notable among the awardees are:

- Prof. T. S. Natarajan received the Eminent Scientist Award by the KG Foundation, Coimbatore, for his outstanding contribution to Science and Technology in Educational Institutions. He was also honoured

with the prestigious IAAM Scientist Medal for the year 2016 at the American Advanced Materials Conference by the Royal Caribbean Cruise, Miami, USA.

- Prof. K. Krishnaiah received the Life Time Achievement Award given by VIT, Vellore for his outstanding contribution to Engineering Education and Research. He was also awarded the “Eminent Engineer’s Award—2018” on the occasion of the 158 Birth Anniversary of Bharat Ratna Sir Mokshagundam Visvesvaraya, and 51st Engineers Day on September 15, 2018 by the Institution of Engineers (India), Tirupati Chapter.
- Dr. Krishna Prapoorna Biligiri has been nominated as Asphalt Rubber Ambassador for the Republic of India by Rubber Pavements Association and RAR–2018 Conference Chairman, South Africa, May 2018, for a period of three years (2018-21).

Conferences, Continuing Education and Outreach Programmes

IIT Tirupati has actively initiated outreach programmes that cater to the needs of teachers, practicing engineers, and researchers. Following notable programmes have been conducted in this regard:

1. In the first year of its operations, IIT Tirupati organised an International Conference on “Sustainable Energy Technologies for Smart & Clean Cities” (SETS &CC-2016) in collaboration with Amara Raja Batteries Ltd., Krishna Theja Educational Institutions, Municipal Corporation of Tirupati, and Southern University, USA, on 27-29 July 2016. The conference was held at Amara Raja Auditorium, Karakambadi, Tirupati.
2. The Department of Mathematics, IIT Tirupati, organized two workshops in collaboration with the 'National Board for Higher Mathematics' on “Advanced Training School on Functional Analysis for Teachers and Research Scholars” and “Complex Analysis and Complex Dynamics for Teachers and Research Scholars” during the periods 11-23 December 2017, and December 10-22, 2018 respectively.
3. IIT Tirupati in collaboration with Indian Institute of Welding (IIW), Chennai Chapter organised a one day workshop on “Advances in Welding Technology” in Sri City, Andhra Pradesh on November 22, 2018.
4. The Department of Humanities and Social Sciences organised a one day workshop on “Academic Writing and Publishing” on December 17, 2018. Dr. Shashank Sinha, Senior Editor, Routledge, India, and Professor Sundar Sarukkai, NIAS, Bengaluru conducted the sessions of the workshop as resource persons.
5. Confederation of Indian Industry (CII) in collaboration with IIT Tirupati, and Texas A&M University, USA organised the Conference on Industry 4.0 - Opportunities, Challenges, and Preparedness on December 17-18, 2018. About 240 delegates attended the conference from India and abroad.
6. IIT Tirupati organized a Faculty Development Program cum Workshop on “Climate across the Curriculum: Educational Resources for Teachers” in collaboration with TROP ICSU, a Climate Education Project of the International Science Council (ISC), on April 26-27, 2019.
7. Dr. Vaneet Kashyap, Department of Humanities and Social Sciences, conducted a training workshop on “Building High-Performance Teams” for executives of Exafluence Pvt. Ltd. Tirupati on April 04, 2019.
8. Keeping in view the rise of the use of Artificial Intelligence (AI), Machine Learning (ML) and Deep Learning (DL), Department of Computer Science and Engineering organized a Summer School on Artificial Intelligence and Machine Learning for the benefit of the academicians, research scholars and industry personnel on July 22 to 26, 2019.
9. IIT and IISER Tirupati jointly hosted the 7th Topical Conference of the Indian Society for Atomic and Molecular Physics between January 6 and 8, 2018 on the theme, “Quantum Collisions and Confinement of Atomic and Molecular Species and Photons”. About 125 delegates attended the conference from India and abroad.
10. Channel 18 of Swayam Prabha DTH Free Channels covering the topics of Mathematics, Physics, Metallurgy and related subjects is coordinated by Prof. T. S. Natarajan from IIT Tirupati.

Memorandums of Understanding Signed

To nurture the collaborative academic and research activities, the Institute has inked MoUs and academic associations with a number of universities, research institutes and laboratories, and industry partners. MoUs have been signed with international academic institutions including Nagaoka University of Technology Japan, Texas A&M Engineering Experiment Station (TEES), USA and University of Calgary, Canada.

To undertake collaborative research with the national research laboratories, MoUs have been entered into with CSIR-CRRI New Delhi, CSIR-SERC Chennai, CSIR-NEERI Nagpur, CSIR-CBRI Roorkee, CSIR-CEERI Pilani, Central Manufacturing Technology Institute (CMTI) Bangalore.

Government organizations with whom MoUs have been entered into include Ground Water & Water Audit (GW&WA) Department, Govt. of AP; and Roads & Buildings (R&B) Department, Govt. of AP. A tripartite MoU between IIT Tirupati, Andhra Pradesh Pollution Control Board (APPCB), and the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India has been entered into to monitor the National Clear Air Programme at the state level.

Industrial partners with whom we have entered into MoUs include:

- Analog Devices India to collaborate in the areas of Digital Signal Processing & Communication
- Toshiba Software India Pvt. Ltd to collaborate in the areas of AI and Data Analytics
- NVIDIA Graphics India Pvt. Ltd to set up a Centre of Excellence in AI.
- Venusgeo/7IQ for setting up a Centre for Excellence (CoE) for Product Engineering and IoT

Infrastructure Development

The Government of Andhra Pradesh has provided a picturesque 530.49 acres land for the development of the permanent campus for the Institute. The site is located on the Yerpedu-Venkatagiri Highway in Merlapaka Village. It is well connected by rail, road and air. 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 has been completed by the State Government.

M/s Suresh Goel & Associates has been appointed as consultant for the campus master plan, design of academic buildings, and design of external service. 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 is integrated with the permanent campus).

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 rivulets 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 2021, buildings and facilities to cater to 1,250 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.

Temporary Campus

IIT Tirupati began functioning from its temporary campus situated on the Tirupati–Renigunta road in the premises of Krishna Theja Group of Institutions. Within a short span of two months, the Institute created all the necessary infrastructure at its temporary campus to ensure the start of academic programmes from August 2015. The Institute also created a kitchen-cum-dining facility on its temporary campus within the record time of 45 days using PEB structures. The student hostels were run at different locations in Tirupati.

Transit Campus

In 2016, in order to address the immediate requirements for student hostels and laboratory facilities, it was decided to build a Transit Campus in the permanent campus site. The Transit Campus, to be integrated in the master plan of the Permanent Campus, has been built in an area of 36 acres within a span of one year adopting fast track and sustainable construction technologies.

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 and 500 kVA sub-station

I take this opportunity to inform the distinguished gathering that IIT Tirupati Transit (Stage 1A) Campus project has won two prestigious sustainability awards, namely, GRIHA and HUDCO awards for the design and use of sustainable and eco-friendly construction materials and technologies. The buildings in the Transit Campus of the Institute have been constructed adopting fast track and sustainable Eco-Friendly construction technologies such as prefabricated Glass Fibre Reinforced Gypsum (GFRG) panels for the hostels and apartment buildings; Pre-Engineered Building structures for laboratories, dining facility and indoor stadium; polished concrete floorings in laboratories. Energy efficient technologies used include, roof-top grid interactive type 210 KW solar power plant, 48 volt DC fittings in the hostels, solar water heaters, and High Volume Low Speed (HVLS) fans - to achieve the goal of causing the minimal damage to the surrounding environment and achieve higher sustainability of the campus. The treated water from the STP is recycled for flushing and gardening purpose.

Student Co-Curricular and Extra-Curricular Activities

Tirutsava: Techno-cultural fest

Tirutsava 2018, the first ever techno-cultural festival of IIT Tirupati was held in March 2018. The second edition was held in February 2019. 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 from various institutes across the city of Tirupati and outside.

SPICMACAY

The IIT Tirupati SPICMACAY Chapter, to promote the Indian classical music and dance among the youth, has organised performances at IIT Tirupati by renowned artists including Bharatnatyam performance by Smt. Lavanya Ananth, Carnatic Vocal Lecture Demonstration Sri Sikkil Gurucharan. The prestigious Virasat series including crafts workshops and performances by leading artists is being organized from August 10 to 17, 2019 at IIT Tirupati.

National Service Scheme (NSS) Activities

Students of IIT Tirupati have been actively engaged in the activities of National Service Scheme. Under this scheme, the students have been visiting various Government schools conducting classes in Science, working with children in the blind school, orphanage and other initiatives run by NGOs. Rural engagement is a core activity for NSS volunteers of IIT Tirupati who adopted five villages to assist in improving the standards of life in those villages. They have been going to villages to spread awareness in respect of various government programmes such as Pulse Polio Abhiyan, Swachchh Bharat Abhiyan etc. The students have been organizing a blood donation camp every year in association with SVIMS.

Clubs and Sports Activities

IIT Tirupati has about 14 active clubs and societies under which they organize various extra-mural activities. The students have been actively participating in the annual Inter-IIT Sports and Inter-IIT Technical meets. With the establishment of sports facilities in the Institute, we hope to win a few medals in the Inter-IIT Sports meet this year.

Placement

In the graduating batch, 100% of the students secured internship in highly reputed national and international organizations. More than 50 companies visited the campus and more than 75 out of 103 students got placed in core engineering and R&D Companies, analytics, consulting and finance, and Information Technology (IT), and rest of the students chose to pursue higher education in the reputed institutions in India and abroad.

For the 2020 graduating batch, a summer internship drive was conducted in which the students actively participated that ensured them 100% internship opportunity. This internship experience has provided them with an opportunity to connect the classroom knowledge with the real-world applications.

Acknowledgements

An endeavor on the scale of this Institute and its entire gamut of activities takes place with the whole-hearted participation and support of all stakeholders - our students, faculty, staff, agencies and industries sponsoring R&D and consultancy projects; professionals from other organizations who assist us in various capacities.

In particular, I would like to thank my faculty members and staff for all the support that they have given in building our Institute. Building an institution from scratch requires a lot of hard work and commitment. They have all stepped up to this challenge.

The Institute is grateful to the Ministry of Human Resource Development, Government of India, for its continued and sustained encouragement and support. The Ministers, officers and staff at MHRD have always been there to address any issue that we needed help on. The liberal funding from the Govt. of India

will enable to set up the initial infrastructure to lay the foundation on which the Institute will continue to grow. We have been fortunate to have all the Hon'ble Ministers of Human Resource Development including Smt. Smriti Irani, Shri Prakash Javadekar and Shri Ramesh Pokhriyal 'Nishank' at our Institute.

I wish to avail this opportunity to place on record our sincere thanks to our mentor Institute IIT Madras which guided us since the inception and was always there to provide any required support.

I also thank the Government of Andhra Pradesh for all the support it continues to extend in multiple ways. The District Administration led by the Collectors, Shri Siddharth Jain, Shri Pradyumna, and Dr. N. Bharath Gupta, has always been helpful in addressing the various issues for land allotment, construction of boundary wall etc.

I wish to thank Shri R. Subrahmanyam, Secretary (HE), MHRD and our Chairman, Board of Governors, and all Board members for their wise counsel, support and guidance, for enabling us to scale new heights.

I would like to express my gratitude to our Chief Guest Shri. Ramesh Pokhriyal 'Nishank' ji, Hon'ble Minister of Human Resource Development for gracing this Convocation. He is a well-known figure in Hindi literature. We are eager to hear from him how our faculty, students and alumni can contribute to this great national effort.

Before I end, I would like to congratulate the prize-winners and wish all our graduating students of the pioneer batch happiness, professional success, and fulfillment from a life of service to their profession, family, country and society at large. You have been an extraordinary batch and have set a benchmark for the future batches with the way you have conducted yourselves with maturity, understanding the difficulties of a new institute in providing the necessary infrastructure. I see a great future for this Institute and assure you that you will be proud of your alma mater when you come back for your reunions.

Jai Hind!

Prof. K. N. Satyanarayana

Director

1. 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 the Building and Works Committee advises the Institute on the matters related to construction of all major capital works. This chapter of the report contains details about the organisational structure of the Institute, including the Members of the Board of Governors, the Senate Committee, and the Building Works Committee. Further, this chapter presents details about the present faculty along with academic and non-academic staff members of the Institute.

1.1 Governance

Board of Governors

Chairman

Shri R. Subrahmanyam, IAS, Govt. of India
Secretary, Department of Higher Education, MHRD

Members

Prof. K. N. Satyanarayana, Director, IIT Tirupati

Prof. Bhaskar Ramamurthi (Up to 11.02.2019)
Director, IIT Madras

Shri S. S. Sandhu, IAS, Add. Secretary (TE), MHRD

Smt Darshana Momaya Dabral, Jt. Sec & FA, MHRD

Shri Prashant Agrawal (Up to 11.02.2019),
Director (IITs), MHRD

Shri G. Yoganand (From 12.02.2019)
Chairman & Managing Director, Manjeera Constructions Ltd, Hyderabad

Prof. K. Srinivasa Reddy (From 12.02.2019)
Professor, IIT Madras

Shri M. Raja Mahender Reddy (From 12.02.2019)
Managing Director, M/s. Venkateswara Pesticides & Allied Chemicals, Hyderabad

Prof. N. N. Kishore (From 12.02.2019)
Professor, IIT Tirupati

Dr. Venkataramana Badarla (From 12.02.2019)
Associate Professor, IIT Tirupati

Member Secretary	Shri Aditya Nath Das (Up to 11.02.2019) Secretary, Department of Higher Education, Govt. of A.P.
	Shri A. V. V. Prasad (From 12.02.2019) Registrar, IIT Tirupati
Finance Committee	
Chairman	Chairman, BoG
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
Senate	
Chairman	Prof. K. N. Satyanarayana, Director, IIT Tirupati
Secretary	Mr. A. V. V. Prasad, Registrar, IIT Tirupati
Members	(All Deans, Professors of the Institute) Prof. K. Krishnaiah, Professor-in-charge - Academic Affairs Prof. V. Raghavendra, Professor-in-charge - Faculty Affairs Prof. N. N. Kishore, Dean - Planning & Infrastructure Prof. P. C. Deshmukh, Dean - Sponsored Research & Consulting Prof. T. S. Natarajan, Dean - International & Alumni Affairs Prof. A. Raghuramaraju, Professor, HSS
Three Educationists of Repute and not Employees of the Institute	Prof. G. Venkataratnam, Department of Mechanical Engineering, IIT Madras Prof. C. Vijayan, Department of Physics, IIT Madras Prof. Malathy D., Department of Humanities and Social Sciences, IIT Madras
Persons from Industry, R&D	Mr. Galla Vijaya Naidu, CEO, Mangal Industries Limited, Tirupati Dr. T. V. C. Sarma, Scientist/Engineer-SG National Atmospheric Research Laboratory, DoS, ISRO, Gadanki, A. P.
Program Coordinators (HoDs)	Dr. R. Harikrishnan, Chemical Engineering Dr. Abhijit Ganguli, Civil Engineering Dr. Venkata Ramana Badarla, Computer Science and Engineering Dr. S. S. Gorthi Rama Krishna, Electrical Engineering

	Dr. V. Vamshi Krishna Reddy, Humanities & Social Sciences
	Dr. Durga Prasad Challa, Mathematics and Statistics
	Dr. Anil Kumar Emadabathuni, Mechanical Engineering
	Dr. Koteswara Rao Bommisetty, Sciences
Faculty Members from the Institute	Dr. N. Venkaiah, Associate Professor, Mechanical Engineering
	Dr. Arun Kumar Manna, Assistant Professor, Chemistry
	Dr. Prasanna V. Sampath, Assistant Professor, Civil Engineering
	Dr. G. Ramakrishna, Assistant Professor, Computer Science and Engineering
	Dr. Subramanyam Gorthi, Assistant Professor, Electrical Engineering
	Dr. S. Rajesh, Assistant Professor, Mathematics and Statistics
	Dr. Chandra Sekhar Bahinipati, Assistant Professor, Humanities & Social Sciences
Assistant Librarian (Ex-Officio)	Mr. K. K. Shameer
Student Members from the Institute	General Secretary
	Academic Affairs Secretary
	Research Affairs Secretary

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, DCSN, DAE, Mumbai
Non-Member Secretary	Shri P. P. Chowdhary, Sr. Project Advisor (Const.), IIT Tirupati

1.2 Faculty Profile

IIT Tirupati completed its second round of recruitment for the various departments in June 2018, and with the joining of the new recruits the total faculty strength will reach 72. To further strengthen the faculty strength at the Institute, another round of faculty selection has been initiated.

Chemical Engineering

Faculty Members



Dr. K. Krishnaiah
Professor



Dr. R. Harikrishnan
Associate Professor



Dr. Arun Kumar Manna
Assistant Professor



Dr. Debashis Mandal
Assistant Professor



Dr. Rajib Biswas
Assistant Professor

Chemistry

Faculty Members

Civil and Environmental Engineering

Faculty Members



Dr. K. N. Satyanarayana
Professor



Dr. Abhijit Ganguly
Associate Professor



Dr. B. Krishna Prapoorna
Associate Professor



Dr. Suresh Jain
Associate Professor



Dr. A. Gowri
Assistant Professor



Dr. Bijily Balakrishnan
Assistant Professor



Dr. B. Janaki Ramaiah
Assistant Professor



Dr. M. Nithyadharan
Assistant Professor



Dr. Prasanna V. Sampath
Assistant Professor



Dr. Romanbabu Oinam
Assistant Professor



Dr. Roshan Srivastav
Assistant Professor



Dr. Shihabudheen M. M.
Assistant Professor

Guest Faculty Member



Dr. B. Radhika
INSPIRE Faculty



Dr. Kalaiselvi
Professor
Rajalakshmi Engineering College

Computer Science and Engineering

Faculty Members



Dr. Venkata Ramana B.
Associate Professor



Dr. G. Ramakrishna
Assistant Professor



Dr. Jaynarayan T Tudu
Assistant Professor



Dr. Kalidas Yeturu
Assistant Professor



Dr. S. Raja
Assistant Professor



Dr. Sridhar Chimalakonda
Assistant Professor



Dr. V. Mahendran
Assistant Professor



Dr. G. Ravi Prakash Iyer
Visiting Faculty

Guest Faculty Member



Dr. Srinivas Padmanabhuni
Chief Mentor, Tarah. AI and
Co-founder, City Mandi

Adjunct Faculty Member



Dr. B. Yagnanarayana
Professor

Electrical Engineering

Faculty Members



Dr. Rama Krishna Sai Gorthi
Associate Professor



Dr. N. N. Murty
Associate Professor



Dr. K. P. Naveen
Assistant Professor



Dr. Parthajit Mohapatra
Assistant Professor



Dr. Pooja Vyavahare
Assistant Professor



Dr. Prasanth Vooka
Assistant Professor



Dr. Sai Krishna P. S.
Assistant Professor



Dr. Subrahmanyam Gorthi
Assistant Professor

Guest Faculty Members



Dr. Vignesh V.
Assistant Professor



Dr. Vikram Pudi
Assistant Professor



Dr. Bijoy Krishna Das
Professor, IIT Madras



Dr. K. M. M. Prabhu
Professor, IIT Madras

Humanities and Social Sciences

Faculty Members



Dr. A. Raghuramaraju
Professor



Dr. Bharat Kumar
Associate Professor



Dr. Chandra Sekhar B.
Assistant Professor



Dr. Prabha Shankar Dwivedi
Assistant Professor



Dr. Rahul A. Sirohi
Assistant Professor



Dr. Saranya Kshatriya
Assistant Professor



Dr. Vaneet Kashyap
Assistant Professor



Dr. V. Vamshi Krishna Reddy
Assistant Professor

Mathematics and Statistics

Faculty Members



Dr. V. Raghavendra
Professor



Dr. Ananya Lahiri
Assistant Professor



Dr. Durga Prasad Challa
Assistant Professor



Dr. Ishpathik Das
Assistant Professor



Dr. Panchatcrahram M.
Assistant Professor

Guest Faculty Member



Dr. S. Rajesh
Assistant Professor



Dr. Srijanani Anurag
Prasad
Assistant Professor



Dr. Sumit Giri
Assistant Professor



Dr. S. G. Kamath
Professor, IIT Madras

Mechanical Engineering

Faculty Members



Dr. N. N. Kishore
Professor



Dr. Anil Kumar E.
Associate Professor



Dr. N. Venkaiah
Associate Professor



Dr. M. Ravi Sankar
Assistant Professor



Dr. D. V. Kiran
Assistant Professor



Dr. Girish Kumar Rajan
Assistant Professor



Dr. Madan Mohan A.
Assistant Professor



Dr. P. Venkatraman
Assistant Professor

Guest Faculty Members



Dr. S. Balaji
Assistant Professor



Dr. Sriram Sundar
Assistant Professor



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



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

Physics

Faculty Members



Dr. P. C. Deshmukh
Professor



Dr. T. S. Natarajan
Professor



Dr. Arijit Sharma
Assistant Professor



Dr. B. Koteswara Rao
Assistant Professor



Dr. Reetesh Kumar Gangwar
Assistant Professor



Dr. Rudra Sekhar Manna
Assistant Professor



Dr. Shaon Sahoo
Assistant Professor



Dr. Vinay Pramod Majety
Assistant Professor

Life Sciences

Guest Faculty Member



Dr. Mousumi Banerjee
Life Sciences

1.3 Academic And Non-academic Staff

Academic Staff

IIT Tirupati completed its second round of recruitment for academic staff in the year 2018. Along with regular, a few staff members on ad hoc basis were also engaged to assist the faculty members in regular course work and conduct of experiments in laboratories effectively. The list of the academic staff in Engineering and Sciences departments, and workshop is given below:

Chemistry



Dr. M. Jagadeesh
JTS



Dr. G. Sanyasi Naidu
JTS



Dr. P. Gopal
Project Associate

Civil Engineering



Mr. Ruthrapathi S
JTS



Mr. A. Priyangan
Junior Technician



Mr. M. Sivanathan
Junior Technician



Mr. M. Sunil Kumar
Junior Technician

Computer Science & Engineering



Mr. R. Nagarajan
JTS



Mrs. J. Suja
Project Officer



Mr. M. Radhakrishnan
Project Officer

Mathematics

Electrical Engineering



Mr. P. Prabhakar Rao
Senior Project Advisor



Mr. D. Ravi Kumar
JTS



Mr. P. Dinesh Khanna
JTS



Mr. Y. Suravardhana
Reddy
JTS



Mr. K. Homprakash
Project Officer



Mr. K. N. Dwarkanath
Project Officer



Mrs. M. Anitha
Project Associate

Mechanical Engineering/Workshop



Mr. A. Ramesh
Krishnan
JTS



Mr. B. Ramesh Kumar
JTS



Mr. P. Dasthagiri
JTS



Mr. P. Sai Chaithanya
JTS



Mr. S.
Venkatanarayana
JTS



Mr. K. Parthiban
Junior Technician



Mr. K. Rohith
Junior Technician



Mr. M. Ramesh
Junior Technician



Mr. T. Sabarinathan
Junior Technician



Mr. U. Bijoy
Junior Technician

Physics



Mr. Vijayaraj
Junior Technician



Mr. D. Varahala Naidu
Project Officer



Dr. P. Mohana Priya
JTS



Mr. V. Uday Kumar
JTS

Non-Academic Staff

In the year 2018, the Institute conducted the second round of recruitment for non-academic staff. Recently retired staff members from ISRO and IIT Madras have also been engaged at IIT Tirupati on contract basis to facilitate the smooth functioning of the system. In addition, some staff members have also been recruited on ad hoc basis to support administrative work of the Institute. Following is a section-wise list of all the non-academic staff members at IIT Tirupati during 2018-19:

Administration



Mr. A. V. V. Prasad
Registrar



Mr. S. K. Sahoo
Deputy Registrar



Mr. V. Adinarayana
Project Advisor



Ms. Sheela Reddy T.
Assistant Registrar



Mrs. Sandhya Y.
Junior Superintendent



Mr. Badireddi Prasad
Junior Assistant



Mr. D. Venkateswara Rao
Junior Assistant



Mr. G. Ramoji Rao
Junior Assistant



Mr. L. Sankar Naidu
Junior Assistant



Mr. Mohammad Ishaq Alikhan
Junior Assistant



Mr. P. Midhun Kumar
Junior Assistant



Ms. S. Ezhilarasi
Project Associate



Mr. V. G. Arul Prasad
Junior Assistant

Academic Affairs



Mr. M. Hari Krishna Reddy
Assistant Registrar



Mr. S. L. Pradeep Valan
Junior Superintendent



Mr. R. Lokesh
Junior Assistant



Mr. T. Siva Kumar
Project Advisor



Mr. Y. Vijay
Junior Superintendent

Accounts

Computer Center



Mr. M. Venkat Reddy
JTS



Mrs R. Aswini
JTS



Mr. T. Senthil
JTS



Mr. G. Ramesh
Senior Project Officer



Mrs. Devi Prashanthi
Project Officer



Ms. K. Manasa
Project Officer



Mr. T. T. Manigandan
Project Officer

Engineering Unit



Mr. P. P. Chowdary
Senior Project Advisor



Mr. V. S. D. Raja
Project Advisor



Mr. A. Senthamil Selvan
Junior Engineer



Mr. T. Chaitanya Subba
Reddy
Junior Engineer



Mr. Muthu Karuppasamy
Project Officer



Mr. G. Narayanan
Project Associate



Mr. Vignesh Kumar
Project Associate

Health Centre



Dr. K. Venkata Ramarao
Medical Officer



Dr. P. Swetha
Medical Officer



Mr. J. Sesa Naidu
Staff Nurse



Mrs Pakala Nagamani
Staff Nurse

Hostels



Mr. K. S. Janakiraman
Senior Project Assistant



Mr. Shameer K. K.
Assistant Librarian



Mrs Fathima Azra Fazal
JTS



Mr. P. Chandra Siva Kumar
Project Associate

Industry Relations



Dr. Tora Mitra Ganguli
Principal Project Officer



Mr. Pushpak Kumar
Placement Officer



Mr. R. Sundaram
Senior Project Advisor

Placement

Sponsored Research and Consultancy

Purchase and Stores



Mr. C. Madurai Muthu
Project Advisor



Mr. K Govinda Chetty
Project Advisor



Mr. A. Jayagopal
Junior Assistant



Mr. S. Anjaneyulu
Junior Assistant

Sports

Swayamprabha Project



Dr. Iyappan I.
Physical Education
Officer



Mr. V. Vasudeva Rao
Physical Training
Instructor



Mr. Arun S.
Senior Project Officer



Mr. Manikandasivam G.
Project Officer

2. Academic Programmes

IIT Tirupati, from the academic year 2018-19, increased its intake of students in B. Tech programme from 120 to 180 by launching B.Tech in Chemical Engineering. The Institute also revised its intake of the number of student in B.Tech programme. Now, the Institute offers admissions to B. Tech programme in the following disciplines:

- Chemical Engineering
- Electrical Engineering
- Civil Engineering
- Mechanical Engineering
- Computer Science & Engineering

The Institute also launched the M. Tech programme during the academic year 2018-19. The specific M.Tech programmes offered at IIT Tirupati are as follows:

- Computer Science and Engineering
- Design and Manufacturing
- Signal Processing and Communications

A total of 58 students have been admitted in all the above three post graduate programme. Further, with focus on research, IIT Tirupati has also been continuing admitting students to its MS (Research) and PhD programmes in both Engineering, Sciences, and Humanities. The present section of the report details about the student statistics and fellowships available.

2.1 Student Statistics

B. Tech Programme

In the academic year 2018-2019, 171 students joined the Institute against 180 sanctioned seats. Out of total 171 students admitted, 142 were boys and 29 were girls. 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. The break-up of the students admitted is summarized year wise in the Table below:

Table 2.1: Details of the B.Tech students admitted in the Institute

Year	General		OBC		SC		ST		Total
	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
2018	67	14	40	8	23	5	12	2	171***

*including 2 preparatory course Students

**including 1 preparatory course Student

***including 2 preparatory course Students

M.Tech Programme

Table 2.2: Details of the M.Tech students admitted in the Institute

Year	Boys	Girls	Total
2018	49	9	58

PhD Programme

Table 2.4: Details of the PhD Scholars admitted in the Institute

Year	Boys	Girls	Total
2018	23	12	35
2019	6	7	13

MS(Research) Programme

Table 2.3: Details of the MS Scholars admitted in the Institute

Year	Boys	Girls	Total
2017	10	1	11
2018	9	2	11
2019	1	-	1

Table 2.5: Details of the students enrolled in the Institute

Programmes	Boys	Girls	Total
B. Tech	411	84	495
M. Tech	44	9	53
MS (Research)	20	3	23
PhD	29	19	48
Total	504	115	619

2.2 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 Government of India norms. A table is given below for the reference:

Table 2.6: Details of the scholarships offered to the B. Tech students:

Sl.No.	Type of Scholarship	Details of Scholarship	No. of Students			
			2015	2016	2017	2018
1.	The Institute Merit-cum- Means scholarship for students whose parents income is less than Rs. 4.5 lakhs per annum	<ul style="list-style-type: none"> Exempted payment of tuition fee Rs. 1000/-per month 	26	29	28	42
2.	The Institute Free Studentship for students whose parent's income is less than Rs. 4.5 lakhs per annum	<ul style="list-style-type: none"> Exempted payment of tuition fee 	5	10	8	4
3.	SC/ST Scholarship	<ul style="list-style-type: none"> Rebate in mess charges up to Rs. 8000 per semester Free lodging Rs. 250/- per month pocket allowance 	5	10	2	16

Fellowship Available to MS (Research), and PhD Scholars

The students admitted to M. Tech get HTTA (Half Time Teaching Assistance) of Rs. 12,400/month, and MS (Research), and PhD students get a fellowship of Rs. 12,400/month, and Rs. 31,000/ month, respectively.

3. 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 in its Temporary campus to meet the expectations and requirements of the students for the initial stage. The Institute has finished building its Stage 1A of the permanent campus, where all engineering laboratories, and workshop have been shifted. Stage 1A of the permanent campus also includes the classroom complex. The Institute also 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.

3.1 Classrooms

The temporary campus building of the Institute houses four 60-seater, five 40-seater, and one 120-seater classrooms with all the necessary furniture. In addition to it, one 120-seater, one 90-seater, one 60-seater, and six 40-seater classrooms have also been built in the Stage 1A of the permanent campus. 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 in the temporary campus.

3.2 Computing & Network Facilities

Computer Laboratories

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

Computer Laboratory - 1 (Temporary Campus)

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 (Temporary Campus)

Computer laboratory-2 is equipped with 26 GPU workstations, each equipped with 23" Display, Intel Xeon 10-core CPU, 128GB RAM, 4TB HDD, 1TB SSD, and 4 NVIDIA RTX 2080Ti 11GB GPU cards.

Computer Laboratory-3 (Permanent Campus)

Computer laboratory-3 is equipped with 65 Dell All-in-computers each with 23.8" Display, 6-core i7 CPU, 8GB RAM, 256GB SSD, and NVIDIA 2GB GPU card.

Institute server facility (Temporary Campus)

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.

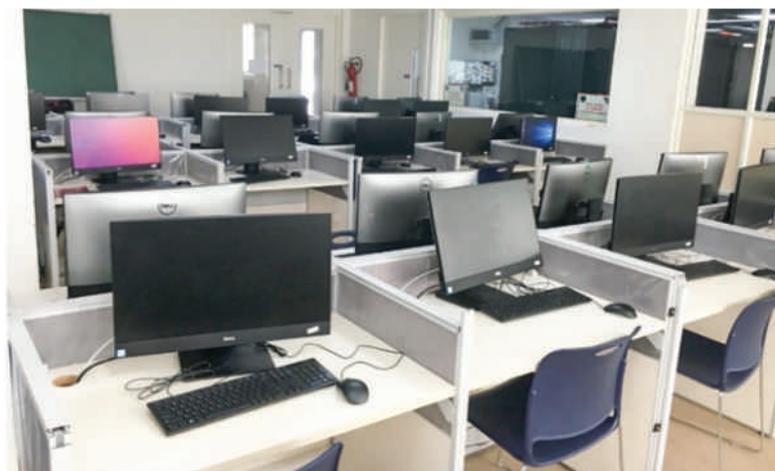
Institute Server facility (Permanent Campus)

Our permanent campus server facility is being set up with 40KW modular smart rack system with integrated modular cooling, UPS backup, and fire extinguishing system to house our servers and HPC systems.

Softwares available

The Institute has bought the rights and license of required softwares 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



A view of Computer Laboratory -3

• 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 1 Gbps 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. The two campuses (temporary and permanent) are connected via a 600Mbps leased-line P2P fibre link.

3.3 Science Laboratories

To cater to undergraduate students, and Ph.D. scholars, Physics and Chemistry laboratories with the state-of-the-art facilities have been developed on the temporary campus. During the year 2018-19, the laboratories got further equipped with more experimental setups added. 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 complexometric 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 conductometric 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

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 measurements (four sets)

The Physics Laboratory was 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 the 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:

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. Using which, one can synthesize a large variety of materials up to 1200°C and in different environments such as vacuum, gas flow (O₂, Ar, N₂), 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 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 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.

Digital Ultrasonic Cleaner

Sonication is the mechanism used in ultrasonic cleaning – loosening particles adhering to surfaces, dispersion of solid samples in liquid medium. Sonication is commonly used in nanotechnology for evenly dispersing nanoparticles in liquids. Additionally, it is used to break up aggregates of micro-sized colloidal particles. It has the tank capacity of around 6 litres with digital timer & heater.



Digital Ultra-sonicator

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 in IIT Tirupati.



The instructor explaining about the functioning of Electrospinning Apparatus

3.4 Workshop

In the first year of B. Tech programme, workshop training sessions for all engineering branches are held in Central Workshop. Central Workshop of IIT Tirupati possesses recent and state-of-the-art equipment. Various equipment including pneumatics and hydraulics training kits, welding simulator, welding machines with gas sucking units, fitting, carpentry, sheet metal, lathe, milling, drilling, shearing, band saw, and power



saw etc. Students not only do welding experiments, but also learn the welding simulation before they actually do. Prior hand held simulation gives students confidence and perfectness during actual welding. We also take care of the environmental aspects during welding process. So, our state-of-the-art welding machines possess gas and dust sucking provision. Thus, our latest welding equipment can protect the students from any type of unwanted gases that comes during welding process.

Workshop provides the individual mask to all students who carry out the carpentry to protect them from wood dust. Workshop also provides the appropriate safety goggles to all students who carry out machining experiments. This shows our commitment towards the safety of each and every student during workshop lab.

3.5 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 2018-19 are here under:

1. Civil Engineering Laboratory

The Civil Engineering Laboratories are located in the Lab-1 block in our permanent campus, Yerpedu. The laboratory is of size 5400 sq. ft having facilities to instruct UG/PG laboratory classes and conduct high quality research. The following are the major laboratory facilities present:

1. Structural Engineering Laboratory
2. Transportation Laboratory
3. Building Material Laboratory
4. Geotechnical Engineering Laboratory
5. Environmental Engineering Laboratory
6. Hydraulics & Water Resources Engineering Laboratory
7. Surveying Laboratory

1.1 Structural Engineering Laboratory

The Structural Engineering Laboratory at IIT Tirupati consists of state-of-the-art table top equipment for under-graduate instruction as well as advanced equipment for research purposes. The equipment in UG laboratory facilitates students to understand the fundamental concepts related to mechanics of materials. A view of the Structural Engineering laboratory is shown in Fig.

The list of equipment available is summarized below.

• Stress analysis in a thin walled cylinder
• Buckling behaviour of Struts
• Deformation of straight beam
• Deformation of bars under bending or torsion
• Bending stresses in beam
• Tension testing machine
• Analysis of statically indeterminate beam
• Analysis of suspension Bridge
• Three Hinged arch
• Unsymmetrical bending of beams
• Pendulum impact tester



A view of table top structural Engg Lab

Following are the other major research equipment available in the laboratory:

1. MTS-100kN servo hydraulic fatigue rated load frame with cross head mounted actuator universal testing machine to study the range of materials including plastics, elastomers, steel, aluminium, alloys and more for range of tests specified below,

1. Monotonic (Tensile/ compressive) loading
2. Reversed cyclic tests
3. Fatigue tests (Low cycle & High cycle), fracture toughness and crack propagation studies
4. Three/four-point bending tests

2. Data Acquisition System (DAQ) and displacement transducers

- 16 Channel DAQ system for strain gauges (HBM Make) – 1 No
- 8 Channel universal DAQ system (HBM Make) – 2 No
- Linear Variable Displacement Transducer (HBM Make)

- 0-20 (4 Nos), 0-50mm (2 Nos), 0-100 mm (1 No)
- Strain Gauges starter kit and Installation Kit – 1 No each

3. Zwick Roell electromechanical actuator of 5kN capacity with load frame for testing films, fibres and composites under monotonic and cyclic loading



A view of lab with 100kN UTM and DAQ system

1.2 Transportation Engineering: Advanced Pavement Systems (APS) Laboratory

Currently, the Advanced Pavement Systems (APS) laboratory at IIT Tirupati is housed inside of a state-of-the-art sustainable building in permanent campus. The equipment housed in this laboratory allows for undergraduate teaching as well as postgraduate and doctoral research activities in the areas of sustainable transportation infrastructure as well as pavements / materials. The APS laboratory is divided into two major sections, as listed under.

The details of the state-of-the-art equipment and accessories under each head is provided below.

- A) Asphalt Binder Characterization Equipment
Semi-automated penetrometer, Ring and ball apparatus, Ductilometer, Rotational viscometer, Dynamic shear rheometer and Pressure aging vessel
- B) Asphalt Concrete and Cement Concrete Mixtures Characterization Equipment
Asphalt mixer, Pan mixer, Marshall Compactor, Marshall stabilometer and Vacuum pycnometer, Superpave gyratory compactor, Los Angeles Abrasion test:

Major research facilities available:

Universal Testing Machine or Dynamic Testing System: This state-of-the-art equipment and several associated accessories are capable of characterizing various pavement materials such as asphalt concrete, pervious concrete, soil, unbound granular materials, fibers, and plastics. The machine houses a computer programmable control unit as well as 16-channel data acquisition control system that is flexible to use any transducer in any channel, which are automatically calibrated on power up.

The following test configurations are available within the system (Fig.):

- i. Uniaxial cyclic compression
- ii. Indirect tensile modulus, creep compliance, and strength
- iii. Indirect tensile fatigue
- iv. Four-point bending on both asphalt concrete and low-strength cement concrete
- v. Dynamic modulus
- vi. Resilient modulus
- vii. Triaxial test
- viii. Semi-circular bending

A collection of a few equipment in the APS laboratory is shown below:



Equipment in Advanced Pavement Systems Laboratory at IIT Tirupati:

- (a) Rotational viscometer (b) Marshall stabilometer (c) asphalt mixer (d) Marshall compactor
 (e) Softening point apparatus (f) Penetrometer (g) Universal testing machine 30 kN capacity
 (h) Ductilometer (i) Dynamic shear rheometer (j) Pressure aging vessel (k) Los Angeles abrasion testing machine

1.3 Building Materials Laboratory

The main objectives of experimental studies on building materials and its components are to facilitate quality control and compliance with specifications. These studies impart an understanding on the test methods to find the physical and mechanical properties of building materials such as ingredients of concrete such as cement, coarse and fine aggregates, wet and hardened concrete, brick and tile etc.

The lab is equipped with the following major equipment in lab:

- 2000kN Load Controlled Compression Testing Machine (CTM)
- Vee Bee Consistometer, Flow Table, Compaction Factor Apparatus, Slump Cone
- Pycnometer and Cylindrical Metal Measure
- Cement Mortar Vibrator, Table Vibrator and Poker Vibrator
- Pan type concrete mixer 130 litre capacity and Drum type concrete mixer 60 litre capacity



2000 kN Load controlled Compression Testing Machine

The experimental studies performed in the lab have been categorized into:

- **Tests on cement:** Normal consistency; Initial and final setting times; Specific gravity; Soundness; Fineness; Compressive strength of cement cubes
- **Tests on coarse aggregate:** Specific gravity; Bulk density; Impact value; Abrasion value; Crushing value.
- **Tests on fine aggregate:** Specific gravity; Bulk density; Particle size distribution
- **Tests on fresh and hardened concretes:** Slump test; Compaction factor test; Flow table test; Vee Bee Consistometer test; Compressive strength of concrete cubes and cylinders; Split tensile strength; Modulus of rupture.
- **Tests on brick:** Compressive strength; Water absorption; Warpage; Efflorescence; Dimensional tolerance.
- **Tests on tile:** Transverse strength of tiles; Wear resistance of tiles

1.4 Geotechnical Engineering Laboratory

The Geotechnical Engineering Laboratory at IIT Tirupati is equipped with the basic and state-of-the-art equipment for Under-graduate and Post-graduate studies to characterize the physical, hydraulic, and mechanical properties of soils under static and seismic loading conditions. In addition to the basic equipment, the laboratory is also fully equipped with advanced testing facilities for research purposes. The laboratory facilities are created with the motive to train and prepare the civil engineering students to meet the industry need in providing solutions to real-life geoenvironmental and geohazards related issues.



Automated direct shear apparatus

3-gang Oedometer setup

1.5 Environmental Engineering Laboratory

The Environmental Engineering program at IIT Tirupati is designed to give an insight into the core skills required to be a professional environmental engineer. The undergraduate and graduate level courses are designed with strong practical components to acquire hands-on experience and equip students to better understand and solve real-life environmental issues. The laboratory is equipped with the state-of-the-art facilities to perform advanced water, wastewater, and air quality analyses. The team of faculty and students are dedicated to research and development and offer engineering solutions to address diverse industrially and socially relevant environmental problems.

- Advanced Instrumentation Facility
- Air and Water Quality Laboratory
- Microbiology Laboratory

Major Analytical Instrumentation Facilities

- UV/Vis Spectrophotometer
- Fluorescence Spectrophotometer
- Inductively Coupled Plasma Mass Spectrometer (ICP-MS)
- Gas Chromatography – Triple Quadrupole Mass Spectroscopy (GCMS-MS)
- Single zone tube furnace
- High-Performance Liquid Chromatography
- Ion Chromatography



A View of Environmental Engineering Lab



1.6 Hydraulics & Water Resources Engineering Laboratory

The Hydraulics and Water Resources Engineering Laboratory at IIT Tirupati boasts of futuristic equipment for under-graduate instruction as well as advanced equipment for research purposes. The laboratory allows students to understand the various aspects of fluids at rest and in motion for use in engineering applications. For instance, students learn the fundamentals of fluid mechanics and hydraulics, such as hydrostatic pressure on plane surfaces, Bernoulli's principle, flow measurement devices, impact of jets on surfaces, frictional losses in pipes, and flow over weirs and notches.

Research equipment include an Advanced Hydrologic Investigation module that can be used for studying a variety of hydrological processes. For instance, this apparatus can be used to study the effects of rainfall of varying durations and intensities on runoff generated and storage capacities of soils. It can also be used to study seepage flow and effects of wells on groundwater levels over time. This apparatus can also study the flow behaviour in rivers, impact of obstacles in the river bed, sediment transport etc.

2. Electrical Engineering Laboratory

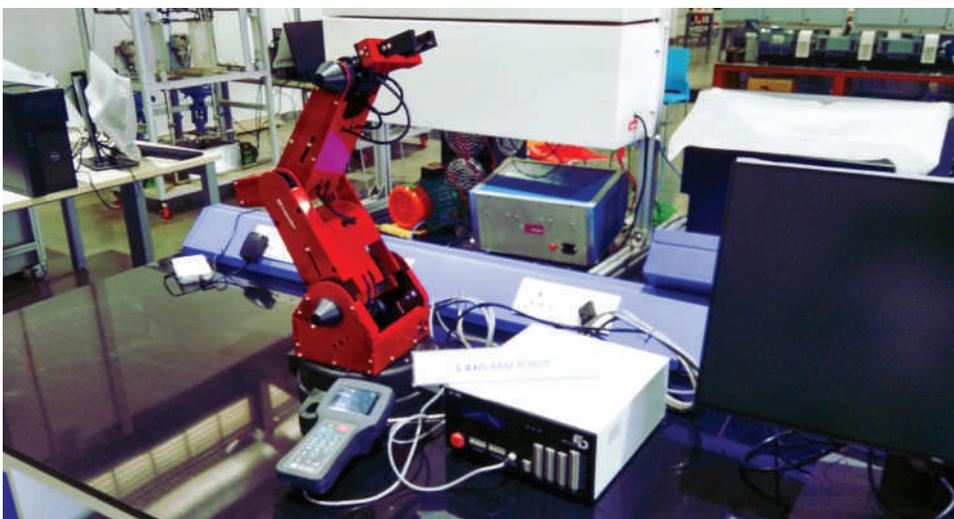
The Department of Electrical Engineering at IIT Tirupati has set up state-of-the-art lab facilities to provide practical exposure to students. Through these labs, over the course of their B. Tech curriculum, students get exposed to various aspects of Electronics, Signal Processing and Communication, Power Systems, and Control and Instrumentation, thus providing an overall exposure to the broad area of Electrical Engineering. The following are the major laboratory facilities present:



A View of few equipment in Hydraulics & Water Resources Lab

1.7 Surveying Laboratory

The surveying laboratory is equipped with a 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 Staff, 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.



A 5-axis Robotic Arm Robot at the Advanced EE Lab

1. Integrated Electronics Laboratory
2. Signal Processing and Machine Learning Laboratory
3. Machines Laboratory
4. Advanced EE Lab
5. Semiconductor Devices Lab

The details of the specific labs, along with the instruments available, are as follows:

2.1. Integrated Electronics Laboratory

The integrated electronics laboratory of IIT Tirupati is well equipped with 30 workbenches consisting of a Tektronix function generator, Digital Storage Oscilloscope along with a power supply and a computer. Analog System Lab pro Development kits developed by Texas Instruments have also been procured that are used for teaching techniques of analog and mixed signal processing. Additionally, the following items are also available at the integrated electronics laboratory.

- a. 4-channel, 350 MHz, 5Gsa/s, Mixed Signal Oscilloscope
- b. Three National Instruments Engineering Laboratory Virtual Instrumentation Suite ELVIS III boards.
- c. Virtual Bench All-in-One Instrument.
- d. Truevolt Benchtop 6-1/2 Digit Multimeter with a 30-ppm basic accuracy.

- e. LCR Meter with frequency range from 20 Hz to 300 kHz with a basic accuracy of 0.1% Students working at the Integrated Electronics Lab From the software front, the Electronics Lab has acquired tools such as OrCAD and PSPICE that are useful for advance level elective courses such as CAD for VLSI Design. PSPICE software in particular is a powerful tool that enables 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 circuits at extreme temperatures and voltages. The above tools are useful from research point-of-view as well.

2.2. Signal Processing and Machine Learning Laboratory

This lab has been set up to meet the requirements of basic as well as advanced level courses pertaining to signal processing and machine learning. This laboratory comprises:

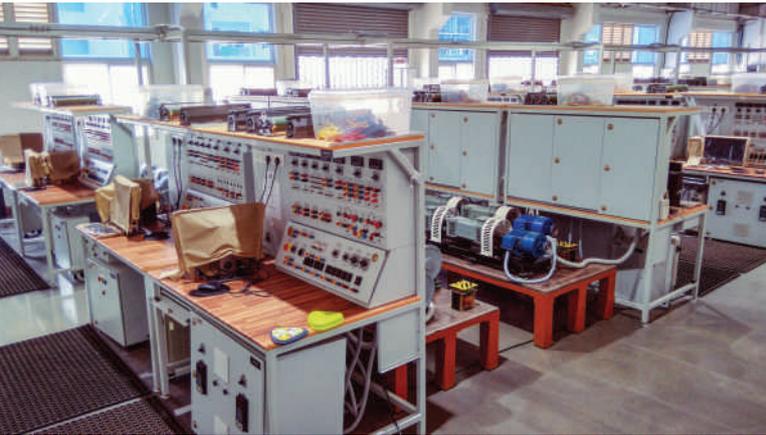
- a. 30 desktops PCs (with 20" external monitor, Intel i5 CPU, 8GB RAM, and 500GB hard disk) to experiment with Signal Processing and Digital Communication algorithms using MATLAB
- b. TMS320C6748 DSP kits for learning hardware signal processing programming and demonstration on real signals/images
-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

2.3. Machines Laboratory

The Electrical Machines laboratory of IIT Tirupati comprises 20 composite machine benches consisting of four electrical coupled machines, a variable output isolation transformer, a load bank, associated instrumentation facilities, a laptop /computer, a worktable, relevant switchgear and inter-connection wires and NI data acquisition. Further, the laboratory is equipped with the following machines/devices:



Students working at the Integrated Electronics Lab

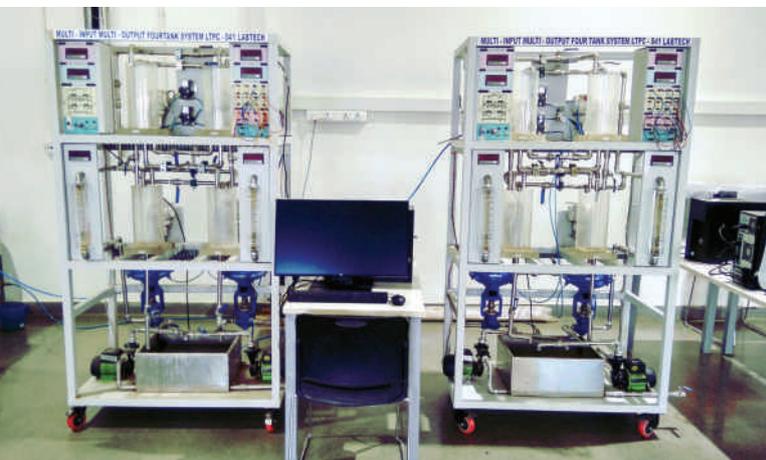


Composite Machine Benches at the Machines Lab

- DC Machines
- Synchronous Machines
- Induction Motor
- Single Phase Transformers
- Three Phase Auto Transformers
- Resistive Load Bank
- Rectifier Setup
- DC and AC Drives
- DAQ

2.4 Advanced EE Laboratory

This higher semester lab aims at bridging the gap between the theory courses (undergone during the earlier semesters) and their practical applications in industry. Different learning and experimental modules have been introduced for students to improve their interdisciplinary skills. In particular, the Lab consists of the following modules:



MIMO 4-Tanks System at the Advanced EE Lab

- a. **Solar energy training system** with experiments on determining I-V, P-V characteristics with effects of temperature, angle of tilt and shading.
- b. **Solar energy emulator** to emulate the output of solar panel under different scenarios such as location, temperature and humidity.
- c. **Wind turbine training system** with experiments on performance analysis and relevant co-efficients.
- d. **Programming a PLC** using IEC standard languages such as Ladder and FBD programming; PLC applications such as control of DC motor, variable frequency drive, star-delta starter, and level control of a MIMO quadruple tank system.
- e. **Robotic training systems** with experiments on Omni-directional and five axis arm robots.
- f. **Internet of Things:** Experiments on configuring various IoTs such as Ubi-mote, Wifi-Mote, BLE mote and integration to a central server using Wingz gateway.
- g. **Electro-Pneumatics and Electro-Hydraulics systems** with experiments on design of pneumatic, hydraulic circuits using FluidSim software and control using hardwired and PLC logic.

2.5 Semiconductor Devices Lab

The Semiconductor Devices Lab aims to introduce semiconductor device characterization experiments to the UG and PG students to complement few of the courses in semiconductor devices and related areas. The lab is equipped with the following instruments:

- a. **For substrate cleaning**
Polypropylene wet chemical bench, Type-I/II DI Water purification system, Hot air oven Ultrasonicator, Programmable hotplate, UV-Ozone cleaner
- b. **For photoresist/thin-film deposition**
Table-top spin coating unit with UV curing lamp



A view of instruments in Semiconductor Devices Lab

- c. **For metal/thin-film deposition**
Table-top DC/RF sputtering unit
- d. **For Optical characterization**
Optical Microscope
- e. **For Electrical characterization**
Semiconductor Parameter Analyser
Mercury Probe
- f. **For bonding/packaging**
Table-top manual Wire bonder

3. Mechanical Engineering Laboratory

The mechanical engineering laboratory caters to the undergraduate, postgraduate and doctoral students by giving hands on experience to them. The laboratories are designed keeping in mind all the domains of mechanical engineering. In addition to regular curriculum work, it also aids in high quality research work.

The following are the major laboratory facilities present:

1. Applied Mechanics Laboratory
2. Thermal Engineering Laboratory
3. Metrology or Meteorology Laboratory
4. Machine Tools Laboratory
5. Joining and Metallography Laboratory
6. Vibrations Laboratory

The details of the specific labs, along with the instruments available, are as follows:

3.1. Applied Mechanics Laboratory

Applied mechanics laboratory has been set up for the students to perform experiments related to the basic principles of solid mechanics and fluid mechanics.

The range of experimental setups in the solid mechanics laboratory are as follows

- Universal testing machine for tensile tests
- Photo elasticity setup
- Analysis of curved beam
- Stress analysis in thick and thin wall cylinder
- Strain guage training kit
- Verification of stress hypothesis
- Creep testing machine



A view of Applied Mechanics Lab

The Fluid Mechanics Laboratory is designed to fortify student's theoretical knowledge which they learned in Fluid Mechanics course by conducting experiments on the equipment, ranging from Reynold's apparatus, Bernoulli's principle, impact of jets on flat and curved surfaces, frictional head losses in pipes, estimation of flowrates in pipes using venture meter/orifice meter, estimating meta-centric height of floating bodies, to flow visualisation using streamlines. The experimental setups in the laboratory are as follows:

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

3.2. Applied Thermal Engineering Laboratory

Applied thermal engineering laboratory has been setup to provide hands-on experience to students on thermal engineering concepts such as Internal combustion engines, refrigeration and air conditioning, fuel property measurements. The laboratory consists of following experimental setups:

- Two-cylinder CRDi Diesel engine setup
- Single cylinder petrol engine setup with open ECU
- Bomb calorimeter
- Vapour compression refrigeration system
- Air conditioning trainer setup
- Dunuoy Ring tensiometer
- Rheometer

The heat transfer laboratory at IIT Tirupati is also a part of the applied thermal engineering lab. It has various experimental setups to enhance students understanding on concepts of heat transfer. This laboratory consists of following experimental setups

- 1) Thermal conductivity measurement of solids and fluids
- 2) Linear and Radial heat conduction setups



A view of Thermal Engineering Lab

- 3) Free and forced convection over different objects
- 4) Pool boiling and condensation experimental setup
- 5) Heat exchanger setup with tube in tube, shell and tube, Plant and fin and jacketed vessel heat exchangers
- 6) Different temperature measurement instruments and their calibration
- 7) Thermal conductivity measurements of insulating materials
- 8) Experimental setup to verify Kirchhoff's law and Stephen Boltzmann Law

3.3. Metrology laboratory

Metrology Lab has been set up for the students to perform various measurement related experiments. We have versatility in the equipment unlike any other metrology lab. We have from basic measurement tools (e.g Vernier ,micrometer etc) to the advanced equipment (e.g 3D scanner, CMM) to meet the present day Industry requirements. Also, we have equipment like Autocollimator, height gauge, surface roughness tester. This lab also houses the following metrology hand tools: GO & NOGO ring, plug and feeler gauges, sine bar, dial gauge setup with magnetic base and thread pluggauge.

The Metrology Laboratory is designed to strengthen student's theoretical knowledge which they learned in Metrology course. The laboratory consists of following experimental setups.

- Coordinate Measuring Machine (CMM)
- 3D Scanner
- Autocollimator setup
- Surface Roughness tester
- Digital Height gauge



Coordinate Measuring Machine



A view of Metrology Lab

3.4. Machine Tools Laboratory

Machine tools laboratory has been set up for the students to perform experiments related to advanced machining process. This Lab has advance machines like CNC Lathe, CNC Milling, CNC Wire cut EDM, CNC milling, CNC lathe and 3D Printer. 3D Printer we have set up this lab in such a way that the Students are able to give CNCProgram through Master Cam, AutoCAD Softwares.

The Machine Tools Laboratory is designed to strengthen student's theoretical knowledge which



A view of Machine Tools Lab

they learned in Manufacturing course. The laboratory consists of following experimental setups

- CNC wire cut EDM
- CNC Milling
- CNC Lathe

3.5. Joining and Metallography (JAM) Laboratory

JAM lab is developed to train the undergraduate and postgraduate students on the latest joining processes and metallographic studies. Active research have been performing in the JAM lab where five PhD and four M.Tech students are pursuing their research work. The JAM lab consists of the below mentioned list of equipment.

Joining Facilities

- Shielded Metal Arc welding process
- Gas Tungsten Arc welding process
- Robotic Gas metal arc welding process
- Submerged arc welding process
- Down drought tables



Joining and Metallography (JAM) Laboratory

Metallography Facilities

- Precision cutting machine
- Hot mounting press
- Double disc polishing machine
- Single disc automatic polishing machine
- Stereomicroscope
- Upright metallurgical microscope
- Heat treatment furnace (1200°C and 1600°C)
- Melting furnace (1500°C)

3.6. Vibrations Laboratory

The Mechanical Vibration Lab provides hands-on experience with instrumentation used for vibration monitoring and modal analysis. The lab is equipped with a mass-spring-damper system to study the effect of structural stiffness and damping on mechanical vibrations. During the laboratory exercises, students utilize this setup to understand the free and forced vibrations and the effect of damping on vibration suppression under resonant conditions. The lab also houses a versatile Data acquisition system OR38. With its embedded computation and storage, OR38 is ideally suited for



OR38 Data Acquisition System

on-line in vehicle NVH measurements with parallel recording. OR38 fulfills the requirements of on-site rotor dynamics and machinery diagnostic for both predictive maintenance and acceptance tests.

The list of other equipment available in this laboratory are as follows:

- Accelerometers and calibrator
- Force Sensors
- Free Field microphone and calibrator
- Dynamic Shaker
- Modal Impact Hammer

3.6 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, supporting their scholarly advancements.

As part of the transition towards permanent campus occupancy, the Library has started a branch Library at the Transit Campus in Yerpedu.

The Central Library is in a fast-growing stage. The Central Library added 848 printed books including textbooks and reference books on Engineering, Science, and Humanities & Social Sciences during this period. We also added about 4500 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), which has enabled computerizing the library operations.



A view of the Central Library

Total number of resources available in Central Library as on 31st March 2019 is as follows,

- Books 5323
- CD-ROM 80
- Newspapers 08
- E-Books 519
- E-Journals 6500+
- Databases 08
- Standards 02

e-Shodh Sindhu Consortium Membership

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

4.

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. Being a new Institute, IIT Tirupati is busy in creating world class research facilities on campus. All the faculty members of the Institute are also engaged in quality research publications, 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:

4.1 Research Publications

During the year 2018-19, a total of 48 research papers were published in the various journals of high repute along with two book chapters, and four books by the faculty members of the Institute.

Journals

Civil Engineering

1. Bhatia, N., **R. Srivastav**, and K. Srinivasan. "Season-Dependent Hedging Policies for Reservoir Operation - A Comparison Study." *Water*, vol. 10, no. 10, September 2018, pp. 1311.
2. Chandrappa, A. K., and **K. P. Biligiri**. "Effect of Pore Structure on Fatigue of Pervious Concrete." *Road Materials and Pavement Design*, Taylor & Francis, vol. 20, no. 19, April 2018, pp 1525-1547.
3. Chandrappa, A. K., and **K. P. Biligiri**. "Investigation on Flexural Strength and Stiffness of Pervious Concrete for Pavement Applications." *Special Issue on Advances in Pavement Technologies in the Emerging Economies, Journal of Advances in Civil Engineering Materials*, ASTM International, vol. 7, no. 2, October 2018, pp. 223-242.
4. Chandrappa, A. K., and **K. P. Biligiri**. "Methodology to Develop Pervious Concrete Mixtures for Target Properties: An Emphasis on the Selection of Mixture Variables." *Journal of Transportation Engineering, Part B: Pavements*, American Society of Civil Engineers, vol. 144, no. 3, September 2018, pp. 04018031-1-10.
5. Chandrappa, A. K., and **K. P. Biligiri**. "Pore Structure Characterization of Pervious Concrete Using X-ray Micro Computed Tomography." *Journal of Materials in Civil Engineering, American Society of Civil Engineers*, vol. 30, no. 6, June 2018, pp. 04018108-1-11.
6. Chandrappa, A. K., R. Maurya, **K. P. Biligiri**, J. S. Rao, and N. Nath. "Laboratory Investigations and Field Implementation of Pervious Concrete Paving Mixtures." *Advances in Civil Engineering Materials*, American Society for Testing and Materials International, vol. 7, no. 1, September 2018, pp. 447-462.
7. Curtis, Z. K., H. S. Liao, S. G. Li, **P. V. Sampath**, and D. P. Lusch. "A Multiscale Assessment of Shallow Groundwater Salinization in Michigan." *Groundwater*, vol. 57, no. 5, February 2019, pp. 784-806.
8. Gautham, A., and **A. Ganguli**. "A Parametric Study on Defect Sizing in Plates using Lamb Wave Reflection Coefficients." *Journal of Structural Engineering, CSIR-SERC*, vol. 45, no. 4, May 2018, pp. 61-66.

9. Ghosh, D., S. Beniwal, **A. Ganguli**, and A. Mukherjee. "Reference Free Imaging of Subsurface Cracks in Concrete using Rayleigh Waves." *Structural Control and Health Monitoring*, vol. 25, no. 10, August 2018, pp. 1-16.
10. Ghosh, D., S. Beniwal, **A. Ganguli**, and A. Mukherjee. "Simulation of Ultrasonic Rayleigh Wave based Damage Detection in Concrete Structures." *Journal of Non-Destructive Testing and Evaluation*, Indian Society of Non-destructive Testing, March 2019, pp 15-19.
11. Kedarisetty, S., G. Saha, **K. P. Biligiri**, and J. B. Sousa. "Performance Evaluation of Reacted and Activated Rubber Modified Dense Graded Asphalt Mixtures." *Journal of Testing and Evaluation*, American Society for Testing and Materials International, vol. 46, no. 6, April 2018, pp. 2511-2520.
12. Khan, V., and **K. P. Biligiri**. "Evolution of Tyre/Road Noise Research in India: Investigations Using Statistical Pass-by Method and Noise Trailer." *International Journal of Pavement Research and Technology*, Elsevier, vol. 11, no. 3, May 2018, pp. 253-264.
13. Mondal, S., and **K. P. Biligiri**. "Crumb Rubber and Silica Fume Inclusions in Pervious Concrete Pavement Systems: Evaluation of Hydrological, Functional, and Structural Properties." *Journal of Testing and Evaluation*, American Society for Testing and Materials International, vol. 46, no. 3, May 2018, pp. 892-905.
14. **Oinam, R. M.**, and D. R. Sahoo. "Using Metallic Dampers to Improve Seismic Performance of Soft-story RC Frames: Experimental and Numerical Study." *Journal of Performance of Constructed Facilities*, ASCE, vol. 33, no. 1, December 2018, pp. 1-18.
15. Sharma, D., and **S. Jain**. "Impact of Intervention of Biomass Cook stove Technologies and Kitchen Characteristics on Indoor Air Quality and Human Exposure in Rural Settings of India." *Environmental International*, December 2018, pp. 240-255.
16. Sharma, D., and **S. Jain**. "Impact of Intervention of Biomass Cookstove Technologies and Kitchen Characteristics on Indoor Air Quality and Human Exposure in Rural Settings of India." *Environmental International*, vol. 123, February 2019, pp. 240-255.
17. Singh, S. P., and **K. P. Biligiri**. "Numerical Simulation of Pervious Concrete Mix Designs Using Discrete Element Modeling Techniques." *Journal of Testing and Evaluation*, American Society for Testing and Materials International, vol. 46, no. 6, November 2018, pp. 2440-2449.
18. Swathi, D., P. C. Sabumon, and **S. M. Maliyekkal**. "Anoxic Ammonia Removal Using Granulated Nanoscale Oxyhydroxides of Fe (GNOF) in a SBR." *Journal of Environmental Chemical Engineering*, vol. 6, no. 4, August 2018, pp. 4273-4281.
19. Venudharan, V., and **K. P. Biligiri**. "Development and Performance Analysis of Asphalt-Rubber Gap-Graded Mixtures: Study on Aggregate Gradations." *Journal of Testing and Evaluation*, American Society for Testing and Materials International, November 2018, pp. 1-18.
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3. Spoorthi, G. E., **S. Gorthi**, and **R. K. Sai S. Gorthi**. "PhaseNet: A Deep Convolutional Neural Network for Two-Dimensional Phase Unwrapping." *IEEE Signal Processing Letters*, vol. 26, no. 1, Jan. 2019, pp. 54-58.

4. Srirag, N., Soumyadeep, Sarita V, and **R. K. Sai S. Gorthi**. "Star Cluster Detection and Characterization Using Generalized Parzen Density Estimation." *Monthly Notices of the Royal Astronomical Society*, vol. 482, no. 3, Jan. 2019. pp. 3789–3802.

Mechanical Engineering

1. **Avulapati, M. M.**, A. Megaritis, J. Xia, and L.C. Ganippa. "Experimental Understanding on the Dynamics of Micro-Explosion and Puffing in Ternary Emulsion Droplets." *Fuel*, vol 239, 2019, pp. 1284-1292
2. **Avulapati, M. M.**, T.N.C. Anand, and R.V. Ravikrishna. "Atomization patterns produced by viscous, like-on impinging liquid jets." *Journal of Flow Visualization and Image Processing*, vol. 25, no. 2, August 2018, pp. 65-76.
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4. Panda, D., **E. Anil Kumar**, and Sanjay K. Singh. "A Comparative Study of CO₂ Capture by Amine Grafted Vs Amine Impregnated Zeolite 4A." *Materials Science and Engineering*, vol. 377, September 2018, pp. 012148.
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1. Vuijk, H. D, A. Sharma, **D. Mondal**, J. U. Sommer, and H. Merlitz. "Pseudochemotaxis in Inhomogeneous Active Brownian Systems." *Physical Review E*, vol. 97, no., 2018, pp. 042612-1 - 042612-7.

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6. Ovsyannikov, S. V., M. Bykov, E. Bykova, K. Glazyrin, **R. S. Manna**, A. A. Tsirlin, V. Cerantola, I. Kuppenko, A. V. Kurnosov, I. Kantor, A. S. Pakhomova, I. Chuvashova, A. Chumakov, R. Rueffer, C. McCammon, and L. S. Dubrovinsky. "Anomalous Charge Ordering in Pressure-tuned Iron Oxide, Fe₄O₅." *Nature Communications*, Nature Publishing Group, vol. 9, October 2018, pp. 4142.
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8. Yoo, K., **B. Koteswararao**, Jeonghun Kang, Aga Shahee, Woohyun Nam, Fedor F. Balakirev, Vivien S. Zapf, N. Harrison, Alexander Guda, Nikita Ter-Oganessian, and Kee Hoon Kim. "Magnetic Field-induced Ferroelectricity in $S=1/2$ Kagome Staircase Compound $PbCu_3TeO_7$." *NPJ Quantum Materials*, vol. 3, September 2018, pp. 45.

Mathematics and Statistics

1. **Challa, D. P.**, A.P. Choudhury, and M. Sini. "Mathematical Imaging Using Electric or Magnetic Nanoparticles as Contrast Agents." *Inverse Problems and Imaging (IPI)*, vol. 12, no. 3, 2018, pp. 573-605.
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1. **Dwivedi, P. S.** "Ontology of Dialogic Inquisition: A Study in Relation to Kena and Prasna Upanisads, and Bergsonism." *Journal of Comparative Literature and Aesthetics*, vol. 42, no. 1, March 2019, pp. 64-72.
2. **Dwivedi, P. S.**, and **V. Vamshi Krishna Reddy**. "From Folios to Film: Understanding the Nuances of Transcreation of Mrchchakatikam as Utsav." *International Journal of Translation*, vol. 30, no. 2, December 2018, pp. 97-112.
3. Patnaik, U., P. K. Das, and **C. S. Bahinipati**. "Developmental Interventions, Adaptation Decision and Farmers' Well-being: Evidence from Drought-prone Households in rural India." *Climate and Development*, vol. 11, no. 4, 2019, pp. 302-318.
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5. **Raghuramaraju, A.** "Compilers Now and Authors Later: Indent from Indian Philosophy." *Barefoot Philosophers: Taking Philosophy Back*, 2019.

4.2 Books and Book Chapters

1. **Dwivedi, Prabha Shankar**. *Epistemology and Linguistics: Bhartrhari, Structuralism, and Poststructuralism*. Motilal Banarasi Dass Publishers, 2019.
2. **Raghuramaraju, Adluru**. *Calibrating Western Philosophy for India: Rousseau, Derrida, Deleuze, Guattari and Vaddera Chandidas*. Routledge India, 2019.
3. **Raghuramaraju, Adluru**. *Vaddera Chandidas: Dharsanam Sahityamu*. Emesco Publications, 2019.
4. **Sirohi, Rahul A.** *From Developmentalism to Neoliberalism: A Comparative Analysis of Brazil and India*. Palgrave Macmillan, 2019.
5. Araya, V., **S. M. Maliyekkal**, and L. Philip. "Water Pollution and Treatment Technologies - Indian Perspective." *Water Futures of India: Status of Science and Technology*, Editors: P.P Mjumdar and V. M Tiwari, Indian National Science Academy, 2019, pp. 215-252.
6. Gopakumar G and **R. K. Sai Gorthi**. "Deep Learning Applications to Cytopathology: A Study on the Detection of Malaria and on the Classification of Leukaemia Cell-Lines." *Handbook of Deep Learning Applications*, V. Emilia Balas, Roy, S. Sekhar, Sharma, D., and Samui, P., Eds. Cham: Springer International Publishing, 2019, pp. 219-257.

4.3 Conference Proceedings/Presentations

The faculty members of IIT Tirupati are actively engaged in presenting their research outputs in the conference/seminars of international repute. A total of 84 research papers were presented by IITT faculty in conferences/seminars during the year 2018-19.

Chemical Engineering

1. **H. Ramanan.** "Electro-Separation Technologies for Water Treatment." *Indo-German Joint Scientific Workshop on "Membranes for Water and Energy"*, CSIR-Central Salt and Marine Chemicals Research Institute, Bhavnagar, Gujarat, 18-20 February 2019.

Civil Engineering

1. Avishreshth, S. J. Gaddam, **P. V. Sampath**, and **K. P. Biligiri.** "An Innovative Approach to Estimate Infiltration Rate of Pervious Concrete Pavements." *International Road Federation Global R2T Expo & Conference*, Las Vegas, USA, 7-9 November 2018.
2. **B. Radhika.** "Reliability Estimation Using Conditional Gaussian Sub-Structuring." *13th International Conference on Computational Structures Technology (CST)*, Barcelona, Spain, 4-6 September 2018.
3. D. Ghosh, Rahul, **A. Ganguli**, and A. Mukherjee. "Ultrasonic Imaging as a Diagnostic Tool for Detection of Rebar Corrosion." *Asia Pacific Workshop on Structural Health Monitoring*, Hong Kong, 12-15 November 2018.
4. D. Ghosh, S. Beniwal, **A. Ganguli**, A. Mukherjee, and S. Bishnoi. "Cross-Correlation Based Imaging of Defects in Plate using Ultrasonic Lamb Waves." *NDE 2018 Conference & Exhibition of the Indian Society for NDT (ISNT)*, Navi Mumbai, 19- 21 December 2018.
5. H. N. Vinay, F. Silva, J. B. Sousa, G. 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.
6. H. N. Vinay, F. Silva, J. B. Sousa, G. 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.
7. H. N. Vinay, V. Venudharan, G. Saha, **K. P. Biligiri**, and K. E. Kaloush. "Mechanistic Performance Prediction of Flexible Pavements at Varying Vehicular Speeds: An Approach to Address Frequency Singularity." *International Road Federation Global R2T Expo & Conference*, Las Vegas, USA, 7-9 November 2018.
8. K Narendar, and **B. Radhika.** "Extreme Value Analysis Based Estimation of Multi-Variate Demand Curves." *Structural Engineering Convention (SEC) 2018*, Jadhavpur University, Kolkata, 19-21 December 2018.
9. K. Narendar, and **B. Radhika.** "Estimation of Multi-variate Demand Curves of Correlated Demand Parameters." *Structural Engineering Convention 2018 (SEC 2018)*, Jadhavpur University Kolkata, India, 19-21 December 2018.
10. Kishore C. Kumar, V. G. Ram, and **K. N. Satyanarayana.** "A Review of Studies on Environmental Performance Analysis of Construction and Demolition Waste Management Using Life Cycle Assessment." *8th International Conference on Sustainable Waste Management*, ANU, Guntur, A. P. 22-24 November 2018.
11. M. Madan, and **S. Jain.** "Real-time Air Quality and Exposure Assessment Inside the Different Passenger Modes of Transport in Delhi." *International Conference on Atmospheric Chemistry and Physics in Highly Polluted Environments*, Indian Institute of Technology Delhi, 24-26 March 2019.
12. N. Kathuria, and **S. Jain.** "Determinants of Lung Cancer using Epidemiological Approach: A Case-control Study." *International Conference on Atmospheric Chemistry and Physics in Highly Polluted Environments*, Indian Institute of Technology Delhi, 24-26 March 2019.

13. **R. M. Oinam**, P. C. A. Kumar, and D. R. Sahoo. "Effectiveness of Steel Fiber in External Beam Column Joints under Cyclic Loading." *16th Symposium on Earthquake Engineering (16SEE), Roorkee*, 20-22 December 2018.
14. 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.
15. **S. M. Maliyekkal**, and U. Kannan. "Development of an Affordable Point-of-use-Disinfection System for Rural India." *International Conference on Engaging Canada and India: Challenges of Sustainable Development Goals*, India International Centre, New Delhi, 8-9 June 2018.
16. S. Mittal, and **K. P. Biligiri**. "A Rational Methodology to Evaluate Resilience of a City Impacted by Disaster: Emphasis on Transportation Infrastructure." *4th World Congress on Disaster Management*, Mumbai, 29 January – 1 February 2019.
17. Singh, A. K. Chandrappa, **P. V. Sampath**, and **K. P. Biligiri**. "Case Studies on the Construction of Pervious Concrete Pavements in India." *International Seminar on Construction and Rehabilitation of Rigid Pavement – Current Practice and Way Forward*, Sponsored by Indian Roads Congress, New Delhi, 18-19 January 2019.
18. Singh, G. S. Jagadeesh, **P. V. Sampath**, and **K. P. Biligiri**. "A Rational Approach for Characterizing In-Situ Infiltration Parameters of Two-Layered Pervious Concrete Pavement Systems." *98th Annual Meeting of the Transportation Research Board, National Academies of Engineering*, Washington, DC, USA, 13-17 January 2019.
19. Singh, G. S. Jagadeesh, **P. V. Sampath**, and **K. P. Biligiri**. "An Innovative Approach to Estimate Infiltration Rate of Pervious Concrete Pavements." *International Road Federation Global R2T Expo & Conference*, Las Vegas, USA, 7-9 November 2018.
20. T. Sharma, and **S. Jain**. "Impact of Transportation Demand Management Policies on the Modal Share and Air Quality in Cities: Causes, Consequences and Effectiveness of Policy Options." *International Conference on Atmospheric Chemistry and Physics in Highly Polluted Environments*, Indian Institute of Technology Delhi, 24-26 March 2019.
21. V. Barthwal, and **S. Jain**. "Occupational Health Effects among Women Construction Workers: A Perception based Cross Sectional Study in Delhi and Satellite Towns." *International Conference on Atmospheric Chemistry and Physics in Highly Polluted Environments*, Indian Institute of Technology Delhi, 24-26 March 2019.
22. V. Venudharan, **K. P. Biligiri**, A. Kumar, U. Mukherjee, and R. Chattaraj. "Field Investigations on Asphalt-Rubber Gap-Graded (AR-Gap) Pavements Placed on Highways in India." *Rubberized Asphalt-Asphalt Rubber 2018 Conference*, Kruger Park, South Africa, 25-28 September 2018.

Computer Science and Engineering

1. N. Sharma, and **S. Chimalakonda**. "Learning Recursion from Music and Music from Recursion." *IEEE 18th International Conference on Advanced Learning Technologies (ICALT)*, IIT Bombay, 9-13 July 2018.
2. N. Sharma, and **S. Chimalakonda**. "Learning Recursion from Music and Music from Recursion." *IEEE 18th International Conference on Advanced Learning Technologies (ICALT)*, July 2018, pp. 257-261.
3. R. Sharma, and **V. Badarla**. "Geometrical Optimization of a Novel Beacon Placement Strategy for 3D Indoor Localization." *IEEE ANTS workshop on Green ICT for Next Generation Wireless Networks*, Indore, 16-19 December 2018.
4. R. Sharma, and **V. Badarla**. "Analysis of a Novel Beacon Placement Strategy for 3D Localization in Indoor Spaces." *IEEE International Conference on COMMunication Systems and NETWORKS (COMSNETS)*, January 2019, pp. 7-11.
5. R. Sharma, and **V. Badarla**. "Geometrical Optimization of a Novel Beacon Placement Strategy for 3D Indoor Localization." *IEEE ANTS workshop on Green ICT for Next Generation Wireless Networks*, December 2018, pp. 16-19.

Electrical Engineering

1. A. Arvanitaki, N. Pappas, **P. Mohapatra**, and N. Carlsson. "Delay Performance of a Two-User Broadcast Channel with Security Constraints." *Global Information Infrastructure and Networking Symposium (GIIS)*, Greece, 23-25 October 2018.
2. A. Sinha, **P. Mohapatra**, J. Lee, and T. Q. S. Quek. "On the Secrecy Capacity of 2-user Gaussian Interference Channel with Independent Secret Keys." *Proc. IEEE ISITA*, Singapore, 28-31 October 2018.
3. A. Thomas, R. Sheeba, and **R. K. Sai S. Gorthi**. "Variable Patch Dictionaries for efficient Compressed Sensing based MRI th Reconstruction." *11th Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP'18)*, IIIT Hyderabad, 18-22 December 2018.
4. D. Singh, J. Mukherjee, **P. S. Saikrishna**, R. Pasumarthy and D. Krishnamurthy. "Performance Management via MPC for Web Services in Cloud." *2018 Annual American Control Conference (ACC)*, Milwaukee, WI, 27-29 June 2018.
5. G.E. Spoorthi, **S. Gorthi**, and **R. K. Sai S. Gorthi**. "A Deep Learning based Model for Phase Unwrapping." *11th Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP'18)*, IIIT Hyderabad, 18-22 December 2018.
6. Haj-Yahya, Jawad, Ming Ming Wong, **V. Pudi**, Shivam Bhasin, and Anupam Chattopadhyay. "Lightweight Secure-Boot Architecture for RISC-V System-on-Chip." *20th IEEE International Symposium on Quality Electronic Design (ISQED)*, Santa Clara, US, 11-13 March 2019.
7. J. K. Mandapalli, S. S. Gorthi, **R. K. Sai S. Gorthi**, and **S. Gorthi**. "Circular Fringe Projection Method for 3D Profiling of High Dynamic Range Objects." *14th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications: VISAPP*, Prague, Czech Republic, 25-27 February 2019.
8. K. Naveen, M. Murali, and **R. K. Sai S. Gorthi**. "Tracking by Detection and Detection for Tracking of RBCs and SPRAM Cells in IFC." *11th Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP'18)*, MedImg Workshop, IIIT Hyderabad, 18-22 December 2018.
9. **K. P. Naveen** and R. Sundaresan. "A Double-Auction Mechanism for Mobile Data-Offloading Markets with Strategic Agents." *WiOpt '18, The 16th International Symposium on Modeling and Optimization of Mobile, Ad hoc and Wireless Networks*, Shanghai, China, 07-11 May 2018.
10. **K. P. Naveen**. "Coexistence of LTE-Unlicensed and WiFi with Optimal Channel Aggregation." *NETGCOOP 18 (International Conference on Network Games, Control and Optimization)*, New York, US, 14-16 November 2018.
11. **K. P. Naveen**. "Performance Analysis of Wireless Networks." *DST-DBT Joint Conclave, Jaipur*, 8-10 June 2018.
12. L. Rout, M Deepak, and **R. K. Sai S. Gorthi**. "WAEF: Weighted Aggregation with Enhancement Filter for Visual Object Tracking." *Computer Vision –European Conference on Computer Vision (ECCV), Visual object Tracking Workshop, Munich, Germany*, 08-14 September 2018.
13. L. Rout, M. R. Priya, M Deepak, and **R. K. Sai S. Gorthi**. "Learning Rotation Adaptive Correlation Filters in Robust Visual Tracking." *14th Asian Conference on Computer Vision (ACCV) 2018*, Perth, Australia, 2-5 December 2018.
14. M. R. Priya, M Deepak, and **R. K. Sai S. Gorthi**. "Visual Object Challenge Results 2018." *Computer Vision –European Conference on Computer Vision (ECCV), Visual object Tracking Workshop, Munich, Germany*, 8-14 September 2018.
15. N. George, **P. Vooka**, and S. Gopalakrishna. "An Efficient Digitizer for Calibration of Instrument Transformers." *2018 IEEE 9th International Workshop on Applied Measurements for Power Systems (AMPS)*, Bologna, 26-28 September 2018.
16. N. George, **P. Vooka** and S. Gopalakrishna. "An Efficient Digitizer for Calibration of Instrument Transformers." *2018 IEEE 9th International Workshop on Applied Measurements for Power Systems (AMPS)*, Bologna, 26-28, September 2018.

17. Priya M Raju, M Deepak, and **R. K. Sai S. Gorthi**. "Bag of Visual Words based Correlation Filter Tracker (BoVW-CFT)." *11th Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP'18)*, IIIT Hyderabad, 18-22 December 2018.
18. T. Sumanth, **K. P. Naveen** and S. Bhashyam. "Infrastructure-Based Wireless Networks: Coverage and Percolation Properties." *SpaSWiN '18 (Workshop on Spatial Stochastic Models for Wireless Networks)*, held in conjunction with *WiOpt '18*, Shanghai, China, 7-11 May 2018.
19. V. Swetha, M. Deepak, and **R. K. Sai S. Gorthi**. "Scale and Rotation Corrected CNNs (SRC-CNNs) for Scale and Rotation Invariant th Character Recognition." *11th Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP'18)*, IIIT Hyderabad, 18-22 December 2018.

Mechanical Engineering

1. **B. Subramanian**. "Drone based experimental investigation of flow around Multi-MW wind farms in different terrains." *1st Meeting of the Industry and Academia Networking Workshop*, National Institute of Wind Energy (NIWE) Chennai, 14 June 2018.
2. **D. V. Kiran**. "Thermal-Metallurgical-Mechanical Modeling of Deposition Welding Processes." *Joint Conclave of Monitoring-cum-Interaction Meet*, Hotel Marriot, Jaipur, 8-10 June 2018.
3. J. Das, S.R. Banik, S.R. S, S., K Reddy, **M.R. Sankar**, and P.S. Robi. "Review on Process Parameters Effect on Fatigue Crack Growth Rate in Friction Stir Welding." *9th International Conference on Material Processing and Characterization (ICMPC-2019)*, GRIET, Hyderabad, 08-10 March 2019.
4. **M. R. Sankar**, S. Saxena, S.R. Banik, I.M. Iqbal, R. Nath, L.J. Bora, and K.K. Gajrani "Experimental Study and Artificial Neural Network Modelling of Machining with Minimum Quantity Cutting Fluid." *9th International Conference on Material Processing and Characterization (ICMPC-2019)*, GRIET, Hyderabad, 08-10 March 2019.
5. Rakesh Sharma and **E. Anil Kumar**. "Selection of Halide Salts Working Pair for Resorption Based Devices." *5th National Conference on Refrigeration and Air Conditioning*, NIT Surathkal, 24-26 May 2018.
6. Ramesh and **S. Sundar**. "Analysis of Drum Brake Defects as a Source of Automotive Vibro-Acoustics." *48th International Congress and Exhibition on Noise Control Engineering*, Madrid, Spain, 16-19 June 2019.
7. S. Singh, R. Bayya, **S. Sundar** and K. P. Biligiri. "Study of Tire-Pavement Noise Generation Mechanism using a Two-Wheeler." *48th International Congress and Exhibition on Noise Control Engineering*, Madrid, Spain, 16-19 June 2019.
8. S. R. Banik, I.M. Iqbal, R. Nath, L.J. Bora, B.K. Singh, N. Mandal, and **M. R. Sankar**. "State of the art on Zirconia Toughened Alumina Cutting Tools." *9th International Conference on Material Processing and Characterization (ICMPC-2019)*, GRIET, Hyderabad, 08-10 March 2019.
9. Surya Prakash R, Prasad Boggavarapu, **M. M. Avulapati**, and Ravikrishna R V. "Secondary atomization- vindication of new breakup regimes and detailed drop sizing." *ICLASS-2018*, Chicago-IL, 22-26 July 2018.

Physics

1. **R. S. Manna**. "Breakdown of Magnetic Order in the Pressurized 3D Kitaev Iridate β -Li₂IrO₃." *American Physical Society (APS) March Meeting*, Boston, USA, 4-8 March 2019.
2. **V. P. Majety**. "Abinitio Molecular Strong Field Ionization." *13th Asian International Conference on Atomic and Molecular Physics*, Mumbai, 3-8 December 2018.

Mathematics and Statistics

1. G. P. Kapoor, and **S. A. Prasad**. "Multiresolution Analysis Based on Coalescence Hidden-Variable Fractal Interpolation Functions." *Fractal Geometry and Stochastics 6*, Bad Herrenalb (Black Forest), Germany, 30 September - 5 October 2018.

2. **I. Das**, S. Sen, N. R. Chaganty, and P. Sengupta. "Regression in the Doubly Inflated Multivariate Poisson Distributions." *National Conference on Challenges and Opportunities in Statistics and Informatics for Futuristic Humanosphere Especially in Agriculture (COSIFHA – 2019)*, S.V. Agricultural College, Tirupati, 29 – 31 January 2019.
3. **S. Rajesh**. "Lim's Center and Fixed-Point Theorems for Isometry Mappings." *10th Asian Conference on Fixed Point Theory and Optimization*, Chiang Mai, Thailand, 16 – 18 July 2018.
4. **S. A. Prasad**. "Riemann-Liouville Fractional Calculus of Blancmange Curve and Cantor Functions." *NSF CBMS Conference - Harmonic Analysis: Smooth and Non-Smooth*, Iowa State University, Ames, USA, 02 – 08 June 2018.
5. **V. Raghavendra**. "Few Remarks on Linear Elliptic Equations." *National Conference on Recent Trends in Mathematics and its Applications (NCRTMA2018)*, Gitam School of Technology, Bengaluru, 21-22 December 2018.
6. **V. Raghavendra**. "On Elliptic Equations: A few Comments." *National Workshop on Mathematics and its Application*, S.V. University, Tirupati, 8-10 November 2018.

Humanities and Social Sciences

1. **A. Raghuramaraju**. "Excavating the Foundations of Inequality." *International Workshop on Egalitarianism, Hierarchy and Global Intellectual Labour Beyond the West*, jointly organized by National Institute of Advanced Studies, Bengaluru and University of Bergen, Norway, in collaboration with European Research Council, at NIAS, Bengaluru, 17-20 September 2018.
2. **A. Raghuramaraju**. "Secular Religiosity and Religious Secularity: Rethinking the Indian Agency in the Shaping of Modernity." *AAS in Asia*, New Delhi, 5-7 July 2018.
3. **A. Raghuramaraju**. "Temporal Imbalance in Debates in Modern Indian Philosophy." *International Conference on New Frontiers in Sanskrit and Indic Knowledge*, Chinmaya University, Cochin, 17-19 December 2018.
4. **C. S. Bahinipati**. "Access to Water Across Smart Cities in India: Issues and Challenges." *SICI International Conference on Engaging Canada and India: Challenges of Sustainable Development Goals*, India International Centre, New Delhi, 8-9 June 2018.
5. **C. S. Bahinipati**. "Do Existing Transformative and Curative Options Effectively Reduce Non-Economic Loss and Damages in Western India?." *4th International Research Symposium of Rajarata University of Sri Lanka-Investing in Biodiversity and Ecosystem Services-ISIBES 2018*, 17-18 October 2018.
6. **C. S. Bahinipati**. "Do Farmers Respond to Climate Change in India: A Systematic Review of Literature." *National Seminar on Green Revolution and Agricultural Sustainability in India: Issues and Challenges*, Ravenshaw University, Cuttack, 23-24 February 2019.
7. **C. S. Bahinipati**. "Does farm-level adaptation to climate change enhance agricultural income? Evidence from drought-prone households in rural India". Technical Consultation workshop on 'Integrated Climate Vulnerability and Risk Assessment in Himachal Pradesh and Tamil Nadu', GIZ, New Delhi, October 25, 2018.
8. **C. S. Bahinipati**. "Economic and Non-Economic Loss and Damage from Droughts in Western India: Role of Irrigation and Crop-Insurance." *Adaptation Futures 2018*, Cape Town, South Africa, 18-21 June 2018.
9. **C. S. Bahinipati**. "Economic and Non-Economic Loss and Damages from Droughts in Western India." *National Workshop on Economic Costs of Climate Change in Rural India*, Madras School of Economics, Chennai, 12-13 July 2018.
10. **C. S. Bahinipati**. "Smart Cities, Access to Safe Drinking Water, and SDGs: Evidences from Indian Cities." *International Conference on Water Security and Climate Change*, Kenyatta University, Nairobi, Kenya, 3-5 December 2018.
11. **C. S. Bahinipati**. "Smart Cities, Access to Safe Drinking Water, and Sdgs: Where Indian Cities Are?"

International Conference on the Challenges of Governance in Mega Cities, Institute for Social and Economic Change, Bengaluru, 25-26 October 2018.

12. **C. S. Bahinipati.** and U. Patnaik. "Does Development Reduce Damage Risk from Climate Extremes? Empirical Evidence for Floods in India". *4th IFMR Annual Research Seminar*, Institute for Financial Management and Research, Sri City, 17-18 April 2018.
13. **C. S. Bahinipati.** V. Kumar and P. K. Viswanathan. "A Systematic Review of Indian Farmers' Adaptation Practices to Climate Change: Scope for Integration of Behavioral and Experimental Economics Principles." *TAPMI-Max Planck- SOTON Winter School on Bounded Rationality 2019*, Manipal, 14-20 January 2019.
14. Pankaj Kumar Verma, and **P. S. Dwivedi.** "Dhananjaya's Conceptions of Dramatic Art and the Dramaturgy of Early Hindi Cinema." *International Conference on Region/Nation/Trans-Nation: Literature-Cinema Interface*, BITS Pilani, Goa Campus, 31 January- 2 February 2019.
15. **P. S. Dwivedi.** "Beyond Text and Textuality: Anumana as a Post-Transformatinal Agenda for a Theory of Poetry." *17th World Sanskrit Conference*, University of British Columbia, Vancouver, Canada, 9-13 July 2018.
16. **P. S. Dwivedi.** "Śītā- A Sylvan Deity: Towards an Eco-Theological Appraisal of Rāmāyaṇa and Uttarrāmacarita." *International Conference on Women, Ecology and Cultural Cognizance: A Boulevard of Sustainable Amiability*, Amrita Vishwa Vidyapeetha, Amritapuri, Kerala, 15-17 December 2018.
17. **P. S. Dwivedi.** "Vedas, and Bhartṛhari: Towards Disinterring the Development of Modern Linguistics." *International Conference on New Frontiers in Sanskrit and Indic Knowledge - 2018*, Chimaya Vishwavidyapeeth, Ernakulam, Kerala, 17-19 December 2018.
18. **P. S. Dwivedi.** "Were Śūdraka's Days More Progressive than Ours? Towards a Dialectical Study of Gender Biases in Mṛcchakaṭīka and Utsav." *ICPR sponsored seminar on 'Women, Gender, and Patriarchy: Exploring the Margins'*, University of Delhi, New Delhi, 15-17 October 2018.

4.4 Invited Lectures Delivered by the IITT Faculty Members

The faculty members were invited to deliver special lectures to different academic institutions in India and abroad. A total of 93 invited lectures were delivered by the IITT faculty members.

Civil Engineering

1. **A. Ganguli:** "Looking Inside Concrete - the Ultrasonic and Thermographic Approaches." Texas A&M University, College Station, Texas, USA, J. Mike Walker '66 Department of Mechanical Engineering, National Academy of Engineering, USA, January 2019.
2. **A. Ganguli:** "Looking Inside Concrete - the Ultrasonic and Thermographic Approaches." University of Houston, Texas, USA, Department of Mechanical Engineering, January 2019.
3. **A. Ganguli:** "Looking Inside Concrete - the Ultrasonic and Thermographic Approaches." University of Massachusetts Lowell, MA, USA, January 2019.
4. **A. Ganguli:** "Looking Inside Concrete - the Ultrasonic and Thermographic Approaches." Northeastern University, Boston, USA, January 2019.
5. **A. Ganguli:** "Looking Inside Concrete - the Ultrasonic and Thermographic Approaches." Transportation Research Board Committee AFF40 Meeting on *Testing and Evaluation of Transportation Structures*, Washington D.C., USA, January 2019.
6. **A. Ganguli:** "Looking inside concrete - the ultrasonic and thermographic approaches." NDE 2018 Conference & Exhibition of the Indian Society for NDT (ISNT), Mumbai, December 2018.
7. **K. P. Biligiri:** "A Rational Approach for Characterizing In-Situ Infiltration Parameters of Two-Layered Pervious Concrete Pavement Systems." *98th Annual Meeting of the Transportation Research Board, National Academies of Engineering*, Washington, DC, USA, 14 January 2019.
8. **K. P. Biligiri:** "Advantages of Pervious Concrete & Asphalt-Rubber Pavement Systems." Workshop on *Sustainable Technologies in Transportation Infrastructure Sector*, Thiruvananthapuram, Kerala, 15 - 16 March 2019.

9. **K. P. Biligiri:** "An Innovative Approach to Estimate Infiltration Rate of Pervious Concrete Pavements." *International Road Federation Global R2T Expo & Conference*, Las Vegas, USA, 7 November 2018.
10. **K. P. Biligiri:** "Asphalt-Rubber Roadway Technology: Towards Futuristic Perpetual Pavement Systems." *Institute Lecture*, Indian Institute of Technology Tirupati, Andhra Pradesh, 31 October 2018.
11. **K. P. Biligiri:** "Development of Warm-Mix Asphalt-Rubber (WM-AR) Mixture Standard Specifications and Design Practices for Road Applications." Research Seminar, *New Faculty Seed Grant Committee Review Meeting, Sponsored Research & Consultancy*, Indian Institute of Technology Tirupati, Andhra Pradesh, India, 18 June 2018.
12. **K. P. Biligiri:** "Mechanistic Performance Prediction of Flexible Pavements at Varying Vehicular Speeds: An Approach to Address Frequency Singularity." *International Road Federation Global R2T Expo & Conference*, Las Vegas, USA, 7 November 2018.
13. **K. P. Biligiri:** "RARX Research in India and Way Forward." Sponsor's Presentation, *RMPD 20 Years Congress*, Lisbon, Portugal, 27-28 March 2019.
14. **K. P. Biligiri:** "Roadway Construction Best Practices: Sustainability in Transportation Infrastructure." 3-Day Residential Training Program for Engineers of the State of Andhra Pradesh, Organized by Andhra Pradesh Human Resource Development Institute, Visakhapatnam, Andhra Pradesh, 21-23 June 2018.
15. **K. P. Biligiri:** "Smart & Sustainable Pavement Systems." A Short-Course on *Sustainable Roadways – Design & Construction*, Center for Continuing Education, Indian Institute of Science Bangalore, Karnataka, 25 September 2018.
16. **K. P. Biligiri:** "Smart & Sustainable Pavement Systems." *Expert Lecture*, R. V. College of Engineering, Bangalore, Karnataka, India, 24 September 2018.
17. **K. P. Biligiri:** "Smart & Sustainable Pavement Technologies: Visions for Future." Keynote Speech, National Conference on *Transportation Research Efforts for Ecological Sustainability*, Organized by VNR Vignana Jyothi Institute of Engineering & Technology, Hyderabad, Telangana, 28 September 2018.
18. **K. P. Biligiri:** "Sustainable & Smart Pavement Technologies: Visions for Future." *ASCE SVEC Student Chapter Expert Lecture*, Sree Vidyaniketan Engineering College, Tirupati, Andhra Pradesh, 6 April 2018.
19. **K. P. Biligiri:** "Sustainable & Smart Pavement Technologies: Visions for Future." *AP HRDI Brainstorming Session*, Organized by Andhra Pradesh Human Resource Development Institute, Bapatla, Andhra Pradesh, 28 May 2018.
20. **M. Nithyadharan:** "Sustainable Construction Techniques in IIT Tirupati." 5 days residential training programme on *Traditional and New Construction Methodologies of Buildings and Bridges*, APHRDI, Bapatla, 12 July 2018.
21. **P. V. Sampath:** "Applications of Data-Intensive Groundwater Modelling Techniques." Indian Institute of Science, Bengaluru, 12 July 2018.
22. **R. M. Oinam:** "Challenges & Issues in Hybrid Simulation" in GAIN course titled "Seismic Performance Assessment of Structures through Numerical and Hybrid Simulations." IIT Hyderabad, Kandi, Telangana, July, 2018.
23. **B. Radhika:** "Principles of 1D Finite Element Analysis." Short Term Training Program on *Computer Aided Analysis and Design of Structures using Finite Element Concepts in Structural Engineering*, SRM Easwari Engineering College, Chennai, 22 June 2019.
24. **S. Jain:** "Air Pollution and Health." 2nd Refresher Course in *Environmental Studies*, UGC-HRDC, JNU, New Delhi, 22 November 2018.
25. **S. Jain:** "Air Pollution Control Systems." Residential Training Programme on *Management of Industrial Pollution*, Environment Training Division, APHRDI, Bapatla, Andhra Pradesh, 11 - 12 February 2019.
26. **S. Jain:** "Auto Fuel and Environmental Pollution." National Training Programme on *Audit of Pollution, Energy and Transport Issues*, International Centre for Environment Audit and Sustainable Development (iCED), Jaipur, 28 August - 20 September 2018.

27. **S. Jain:** "Environmental Impacts of Energy Sector Infrastructure Projects or Environmental Impacts of RE Sector." National Training Programme on *Environment Impact Assessments and Audit of Infrastructure Projects*, International Centre for Environment Audit and Sustainable Development (iCED), Jaipur, 4 - 8 February 2019.
28. **S. Jain:** "Environmental Implications of Renewable Energy: Opportunities and Challenges." National Training Programme on *Environment Management in Workshops and Manufacturing Units of Public Sector Enterprises (PSEs)*, International Centre for Environment Audit and Sustainable Development (iCED), Jaipur, 7- 11 January 2019.
29. **S. Jain:** "Issue of Energy Efficiency in Public Transport Sector." National Training Programme on *Environment Management in Workshops and Manufacturing Units of Public Sector Enterprises (PSEs)*, International Centre for Environment Audit and Sustainable Development (iCED), Jaipur, 7-11 January 2019.
30. **S. Jain:** "Source apportionment case studies." Winter School on *Receptor Modelling Methods for Source Apportionment*, IIT Madras, 5 December 2018.
31. 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.
32. **S. M. Maliyekkal:** "Application of nanoscale materials in Civil and Environmental Engineering." Two Day Symposium on *Sustainable Construction Materials and Techniques (SCMT-18)*, Sreenidhi Institute of Science and Technology, Ghatkesar Hyderabad, 29 - 30 June 2018.
33. **S. M. Maliyekkal:** "Fabrication of Sustainable Nanoscale Materials: Application in Environmental Remediation." *Recent Trends in Environmental Engineering*, TKM, Kollam, Kerala, 15 - 20 July 2019.
34. **S. M. Maliyekkal:** "Graphene and its Derivatives: Opportunities and Challenges." DST-SERB sponsored 2-day workshop on *Graphene-Nanotechnology: Civil Engineering Applications*, Coimbatore, Tamil Nadu, 7 - 8 June 2018.
35. **S. M. Maliyekkal:** "New and Efficient Technologies on Fluoride Removal." Two Day National Workshop on *Management of Grey Water in Rural Areas and Arsenic and Fluoride Remediation*, IIT Madras, 22 - 23 March 2019.
36. **S. M. Maliyekkal:** "Sustainable Nano-composites for Food Processing and Preservation." Conference on *Food Processing & Allied Industries Theme 'Rejuvenating Innovation and Challenges in Food Processing and Allied Sectors*, Fortune Select Grand Ridge, Tirupati, 16 - 17 October 2019.
37. S. Mittal, and **K. P. Biligiri:** "A Rational Methodology to Evaluate Resilience of a City Impacted by Disaster: Emphasis on Transportation Infrastructure." 4th World Congress on *Disaster Management*, Mumbai, 31 January 2019.
38. Singh, and **K. P. Biligiri:** "Smart Pervious Concrete Pavements." Documentary Presentation for *Greater Visakhapatnam Municipal Corporation Commissioner*, Organized by Greater Visakhapatnam Municipal Corporation, Visakhapatnam, Andhra Pradesh, 23 June 2018.
39. V. H. Nanjegowda, F. Silva, J. B. Sousa, G. 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.
40. V. Venudharan, **K. P. Biligiri**, A. Kumar, U. Mukherjee, and R. Chattaraj: "Field Investigations on Asphalt-Rubber Gap-Graded (AR-Gap) Pavements Placed on Highways in India." *Rubberized Asphalt-Asphalt Rubber 2018 Conference*, Kruger Park, South Africa, 25-28 September 2018.

Computer Science and Engineering

1. **G. Ramakrishna:** "An Overview on Design and Analysis of Algorithms." Chadalawada Ramanamma Engineering College, Tirupati, 6 April 2018.

2. **Kalidas Y.:** "Concepts in Machine Learning Algorithms and Applications", SITAMS Engineering College, Chittoor, 23 March, 2019.
3. **Kalidas Y.:** "Directorate General Information Systems – Round Table Meeting on AI for Indian Army." New Delhi, 04 May 2018.
4. **Kalidas Y.:** "Machine Learning Algorithms and Smart Applications." SPMVV Tirupati, 25 January 2019.
5. **Kalidas Y.:** "Machine Learning for Bioinformatics", 8th National Seminar on Bioinformatics, SVIMS Tirupati, 22 February 2019.
6. **Kalidas Y.:** "National Conference on Emerging Computing Technologies and Applications (NCECTA)." Veltech University, Chennai, 05 April 2018.
7. **Kalidas Y.:** "Powering AI and ML Solutions", HPC Symposium, Jaipur, 12 July 2018.
8. **V. Badarla:** "A Next Generation of Networking for IoT." *National Conference on Developments in Information and Communication Technology for Emerging Regions*, Sri Padmavati Mahila Visvavidyalayam, Tirupati, 28 January 2019.
9. **V. Badarla:** "Software Defined Networking: Mastering in Complexity vs Exploiting Simplicity." IIT Jodhpur, 31 October 2018.
10. **V. Badarla:** "The Emerging Trends in Computer Science & Engineering." Cynosure Technical Symposium, Sri Venkateswara University, Tirupati, 29 March 2018.

Electrical Engineering

1. **K. P. Naveen:** "Coexistence of LTE-Unlicensed and WiFi: An Auction Theoretic Approach." Institute Seminar, IIT Delhi, 12 April 2018.
2. **K. P. Naveen:** "Mobile Data Offloading: Optimization and Game Theoretic Approach." Workshop on *Advances in Wireless Communication*, KLE Technological University, Hubballi, 21 July 2018.
3. **P Mohapatra:** "Information Theory and Future Wireless Networks." Special lecture in two-weeks faculty development program on *5G Wireless Communication, AICTE-QIP*, Thiagarajar College of Engineering, Madurai, 28 January. 2019.
4. **P. S Saikrishna:** "Model Identification and Control for a Cloud Data-Centre." SUNY Binghamton - IIT Madras Joint Workshop on *Energy Optimization in Data Centres*, September 2018.
5. **P. S. Saikrishna:** "Cloud Computing and Applications." *Two days' Workshop at SPMVV Society for Innovation and Incubation (SSIIE-TBI)*, Tirupati, January 2019.
6. **P. Vooka:** "Capacitance to Digital Converters." One day workshop on *Recent Trends in Electrical Engineering RTEE-2018*, AICTE, Siddhartha Engineering College, Vijayawada, 7 December 2018.
7. **R. K. Sai S. Gorthi:** "Current Trends and Advancements in Signal and Image Processing: Towards Machine Learning." *National Workshop on Signal and Image processing*, Vellore Institute of Technology, 28 September 2018.
8. **R. K. Sai S. Gorthi:** "Deep Learning for Computer Vision." FDP organized by EICT Academy, NIT Warangal on *Recent Trends in Image & Video processing*, VR Siddhartha College of Engineering, Vijayawada, 16 Feb. 2019.
9. **R. K. Sai S. Gorthi:** "Machine learning for Image processing." FDP organized by EICT Academy, NIT Warangal on *Computer Vision and Image processing* at Srinivasa Ramanujan Institute of Technology, Anantapuramu, 15 December 2018.
10. **S. Gorthi:** "Introduction to Image Processing in Medical Imaging." Indian Council of Medical Research (ICMR) sponsored national level seminar on *Cancer Detection Using Digital Image Processing Techniques*, S V Engineering College for Women, Tirupati, 22 June 2018.
11. **V. Vignesh:** "Cyber-Power Testbed for Distributed Monitoring and Control." *Power Engineering Research and Applications 2018 (PERA18)*, IIT Kanpur, November 2018.

12. **V. Vignesh:** "Modelling, Control, and Cyber Physical Analytics for Smart Grids." Continuing Education Program on *Advanced Technologies in Power Engineering*, NIT Warangal, December 2018.

Mechanical Engineering

1. **B. Subramanian:** "Wind Turbine Aerodynamics." Faculty Development Programme on *Solar and Wind Energy- Future Technologies*, Jawaharlal Nehru Technological University Anantapur (JNTUA), Anantapur, Andhra Pradesh, 22 November 2018.
2. **E. Anil Kumar:** "Advanced Refrigeration Systems for Sustainable and Environmental Friendly Energy Conversion." Guntur Engineering College, Andhra Pradesh, Andhra Pradesh, 25 August 2018.
3. **E. Anil Kumar:** "Advances in Energy Conversion Technologies." *IGNITE-2K19*, Lingaya Institute of Management and Technology, Vijayawada, Andhra Pradesh, 03 March 2019.
4. **E. Anil Kumar:** "Energy Storage Options for Solar PV and Wind Energy Systems and Hydrogen As a Energy Carrier For Transportation." Faculty Development Programme on *Solar and Wind Energy- Future Technologies*, Jawaharlal Nehru Technological University Anantapur (JNTUA), Anantapur, Andhra Pradesh, 22 November 2018.
5. **E. Anil Kumar:** "Metal Hydride Based Thermochemical Energy Storage." Faculty Development Programme on *Solar and Wind Energy- Future Technologies*, Jawaharlal Nehru Technological University Anantapur (JNTUA), Anantapur, Andhra Pradesh, 22 November 2018.

Physics

1. **R. S. Manna.** "Searching for Spin-Liquid Behavior in Kitaev Iridate." Indian Institutes of Science Education and Research (IISER) Trivandrum, 18 June 2018.

Chemistry

1. **R. Biswas:** "In Silico Spectroscopy and Structure-Spectrum Correlations of Aqueous Systems." *Conference on Recent Advances in Dynamics at the Interface of Chemistry and Biology (DICB - 2019)*, Indian Institute of Science, Bengaluru, 18-20 February 2019.

Mathematics and Statistics

1. **A. Lahiri:** "Asymptotic Properties of the Volatility Estimator from High Frequency Data Modeled by Mixed Fractional Brownian Motion." *Statistical Methods in Finance 2018*, Chennai Mathematical Institute, Chennai, 17 December 2018.
2. **I. Das:** "Applications of Statistics in Clinical Trials." *98th Birthday Celebration of Prof. C. R. Rao*, Sri Venkateswara University, Tirupati, 9-10 September 2018.
3. **P. Mariappan:** "Applications of Analysis and Algebra." *National Workshop on Mathematics and its Applications*, SV University, 9 November 2018.
4. **P. Mariappan:** "Germany Research and Me." *Rediscover Germany-Higher Education and Beyond*, IISER Tirupati, 16 March 2019.
5. **P. Mariappan:** "Mathematical Modeling of Bioheat Equation." *National Conference on Mathematics and its Applications*, SV University, 29 March 2019.
6. **S. Giri:** "Distribution of Frobenius Angles." *Intercity Number Theory Seminar*, IISER Tirupati, Tirupati, 17 December 2018.
7. **V. Raghavendra:** "A Few Remarks on Linear Elliptic Equations, Itinerary." *National Conference on Recent trends in Mathematics and its Applications*, GITAM School of technology, Bangaluru, 22 December 2018.
8. **V. Raghavendra:** "Classical Solution of a Class of Nonlinear Elliptic Equations." *National Conference on Recent Trends in Differential Equation: Theory, Modeling and Computation 2019 (NCDE-2019)*, IIT Patna, March 29, 2019.

9. **V. Raghavendra:** "Weak Solutions of Partial Differential Equations with a Touch of Functional analysis." Lecture Series, IIT Madras, Chennai, 14-15 November 2018.

Humanities and Social Sciences

1. **A. Raghuramaraju:** "From No-Violence to Non-Violence: Mahatma Gandhi's Interpretation of Bhagavad Gita." *D. Rama Kotaiah Endowment Lecture* at Acharya Nagarjuna University, 10 April 2018.
2. **A. Raghuramaraju:** "The Relevance of Gandhian Ideals Today." Amaravati Institute of Social Science, Guntur, 14 August 2018.
3. **A. Raghuramaraju:** "Relevance of Sri Aurobindo's Savitri." Sri Aurobindo Society, Tirupati, on 15 August 2018.
4. **A. Raghuramaraju:** "Rereading Rousseau's The Social Contract." Six-day Faculty Development Program on *Teaching Methodologies in Philosophy* Teaching Learning Centre of Ramanujan College, University of Delhi on 3 November 2018.
5. **A. Raghuramaraju:** "Revisiting Explorers in Upanishad, Badarayana the Compiler and Goudapada the Comparative philosopher." Six-day Faculty Development Program on *Teaching Methodologies in Philosophy* Teaching Learning Centre of Ramanujan College, University of Delhi on 3 November 2018.
6. **A. Raghuramaraju:** "Re-examining the Genealogy of Classical Indian Philosophy." *The Centre for Philosophy*, Jawaharlal Nehru University, New Delhi, 5 November 2018.
7. **A. Raghuramaraju:** "Manage an Enigmatic India." *International Conference on Essential Management in the Age of Disruption*, Department of Management Studies, S. V. University, Tirupati, on 19 January 2019.
8. **A. Raghuramaraju:** "Science and Spirituality: The Transition Context." *Regional Conference on Towards Peace, Harmony, Happiness: Transition to Transformation*, Institute of Public Enterprise, Hyderabad, 22-23 March 2019.
9. **C. S Bahinipati:** "Rural Livelihood Program, Farm-Level Adaptation and Economic Wellbeing: Evidences from Western Odisha, India." International Potato Center (CIP), Nairobi, 5 December 2018.
10. **C. S. Bahinipati:** "Does Development Reduce Damage Risk from Climate Extremes? Empirical Evidence for Floods in India." Ashoka Trust for Research in Ecology and Environment (ATREE), Bengaluru, 16 July 2018.
11. **C. S. Bahinipati:** "Climate Change: Issues, Challenges and Policy Dimensions." Andhra Pradesh Human Resource Development Institute, Bapatla, 9 July 2018.
12. **P. S. Dwivedi:** "Science of Language: A Brief Survey with Special Reference to Articulatory Phonetics." *Refresher Course on Language and Literature*, HRDC, SV University, Tirupati, September 2018.
13. **P. S. Dwivedi:** "Indian and Western Poetics: Towards a Comparative Understanding." *Refresher Course on Language and Literature*, HRDC, SV University, Tirupati, September 2018.
14. **Vamshi Krishna Reddy:** "Reading Indian Cinema." *Refresher Course on Language and Literature*, HRDC, SV University, Tirupati, September 2018.
15. **Vamshi Krishna Reddy:** "Popular Culture and Indian Cinema: A Study of Interaction." *Refresher Course on Language and Literature*, HRDC, SV University, Tirupati, September 2018.

4.5 Sponsored Projects

1. **A. K. Manna:** Early Career Research Award (ECRA) for the project entitled, "Ab Initio Modeling of Defects in Nanoscale Materials", funded by the DST-SERB. Amount sanctioned – Rs. 48,53,438/- for a period of 3 years, 2018-2021.
2. **B. Subramanian:** "A Novel Approach to Wind Turbine Siting and Wind Resource Assessment Using Smart Drone Based Wind Measurement System", funded by SERB under ECR Grant. Amount sanctioned— ₹49.99 lakh, for a period of three years, June 2019.
3. **C. S. Bahinipati:** "Role of Institutions, Incentives and Information in Enhancing Climate Resilient Agricultural Interventions and their Impacts across States in India", funded by Indian Council of Social

Science Research, New Delhi, led by Amrita Vishwa Vidyapeetham and IIT Tirupati. Amount sanctioned— ₹30 Lakh, for two years, April 2018.

4. **D. Mondal:** "Investigation on Stochastic Thermodynamics of Entropic Information: Aiming to Beat the Landauer's limit", funded by DST-SERB for Early Career Research Award. Amount sanctioned— ₹28 lakhs, March 2019-February 2022.
5. **D. P. Challa,** "Wave Propagation by Small Inhomogeneties: Applications to Medical Imaging, Effective Medium Theory and the theory of Meta-materials", funded by DST SERB MATRICS. Amount sanctioned— ₹6.6 Lakhs, June 2018 – May 2021.
6. **D. V. Kiran and N. Venkaiah:** "Narrow Gap Welding of 12 mm Thick Naval Steel Using Tandem Gas Metal Arc Welding Process", funded by Naval Research Board. Amount sanctioned— ₹27.3 lakhs, duration for two years, December 2018.
7. **D. V. Kiran:** "Thermal-Metallurgical-Mechanical Modeling of Deposition Welding Processes", funded by Science and Engineering Research Board, Amount sanctioned— ₹35 lakhs, duration for five years, February 2016. (Note: It is a transferred project from IIT Roorkee with effect from April 2018).
8. **E. Anil Kumar:** "DST-IIT Bombay Energy Storage Platform on Hydrogen", funded by Department of Science and Technology (DST) led by IIT Bombay, Contributed by IIT Tirupati, IIT Guwahati, IIT Kanpur and NIT Rourkela. Amount sanctioned— ₹866.1532 Lakh, for five years, March 2019.
9. **E. Anil Kumar:** "Hybrid Mechanical Vapor Compression with Coupled Pressure and Temperature Swing Adsorption for Smart Chiller", funded by Science & Engineering Research Board (SERB), led by Kharagpur, Contributed by IIT Tirupati. Amount sanctioned— ₹54.09549 Lakh, for five years, March 2019.
10. **E. Anil Kumar:** "Synthesis and Characterization of Thermochemical Materials for Solar Thermal Energy Storage", funded by Science & Engineering Research Board (SERB), mentored by IIT Tirupati, and Contributed by MVGR College of Engineering. Amount sanctioned— ₹18.1 Lakh, for a period of three years, November 2019.
11. **K. P. Biligiri:** Principal Investigator, "Development of Warm-Mix Asphalt-Rubber (WM-AR) Mixture Standard Specifications and Design Practices for Road Applications", New Faculty Seed Grant (NFSG), Indian Institute of Technology Tirupati, India. Amount sanctioned – ₹2500000, June 2018 – May 2021.
12. **M. M. Avulapati:** "Developing a Novel Twin-Fluid Atomizer for Energy Efficient Spray Drying of High Viscosity Liquids", funded by SERB under Core Research Grant. Amount sanctioned— ₹46.2, lakh for a period of three years, February 2019.
13. **P. S. Saikrishna:** "Enhancing QoS in Mobile Edge Computing", Shastri Indo Canadian Institute Travel Grant, June 2018.
14. **P. V. Sampath:** Principal Investigator, "A Data-Intensive Groundwater Modelling Approach for Evaluating Sustainability of Groundwater Use", funded by SERB, DST. Amount sanctioned – ₹27.86 Lakhs, August 2018 – August 2021.
15. **R. A. Sirohi,** and **C. S. Bahinipati:** "Assessing Households' Preference for Energy Efficient Appliances in Bengaluru City, India: Internalities, Externalities and Social Norms" funded by Indian Council of Social Science Research, New Delhi (under Impactful Research in Social Science). Amount sanctioned— ₹11.55 Lakh, for two years, March 2019.
16. **R. S. Manna:** "Lattice Effects in Strongly Correlated Electron Systems at Extreme Conditions." Early Career Research (ECR) award funded by SERB. March 2019 - 2022.
17. **S. Giri:** "Points on Elliptic Curve Over Finite Fields" funded by DST INSPIRE Faculty Program, Amount sanctioned— ₹35 lakhs, February 2019 - January 2024.
18. **S. M. Maliyekkal:** Co-Principal Investigator, "Centre for Sustainable Treatment, Reuse and Management for Efficient, Affordable and Synergistic solutions for Water (WATER-IC for SUTRAM of EASY WATER), DST/TM/WTI/WIC/2K/82(G)", funded by Department of Science and Technology, Water Technology Initiative. Amount sanctioned – ₹893.56 Lakhs, November 2018 - 2023.

4.6 Consultancies

1. **C. S. Bahinipati:** "Indo-German Environment Program in Rural Areas: An Integrated Climate Risk and Vulnerability Assessment in Tamil Nadu and Himachal Pradesh", funded by GIZ Germany, led by University of Geneva, INRM Consultants Pvt. Ltd., Madras School of Economics, and Indian Institute of Technology Tirupati. November 2018.
2. **J. Ramaiah and Nithyadharan M.:** "Vetting of Structural Design Calculations of The Proposed Raw Water Pumping Main from Kailasagiri Reservoir to Mangalam Pump House in Tirupati (under AMRUT-II (2016-2020) scheme)". Amount sanctioned – ₹1,00,000, April 2018 – July 2018.
3. **K. P. Biligiri:** "Proof Checking of Pavement Design Report of Six Laning of Anandapuram-Pendurthi-Anakapalli Section of NH-5 (new NH-16) from km. 681+000 to km. 731+780 in the State of Andhra Pradesh", Proof Checking Report, Sponsored by Dilip Buildcon Limited, Bhopal, Madhya Pradesh, India. Amount sanctioned – ₹400000, December 2018 – January 2019.
4. **M. Nithyadharan and Bijily Balakrishnan:** "Proof Checking of G+4 Precast Wall Panel Building in Bhubaneswar for EWS Housing". Amount sanctioned – ₹1,00,000, Oct 2018 – Dec 2018.
5. **M. Nithyadharan, and Janaki Ramaiah:** "500 KL capacity 40m tall R.C.C. Elevated Balanced Reservoir (ELBR) in Mangalam, Tirupati (under AMRUT-II (2016-2020) scheme)". Amount sanctioned – ₹1,00,000, April 2018 – July 2018.
6. **P. Mariappan:** "CFD Software Consultancy Project", funded by NUMA Engineering Services Ltd, Ireland, March 2019.

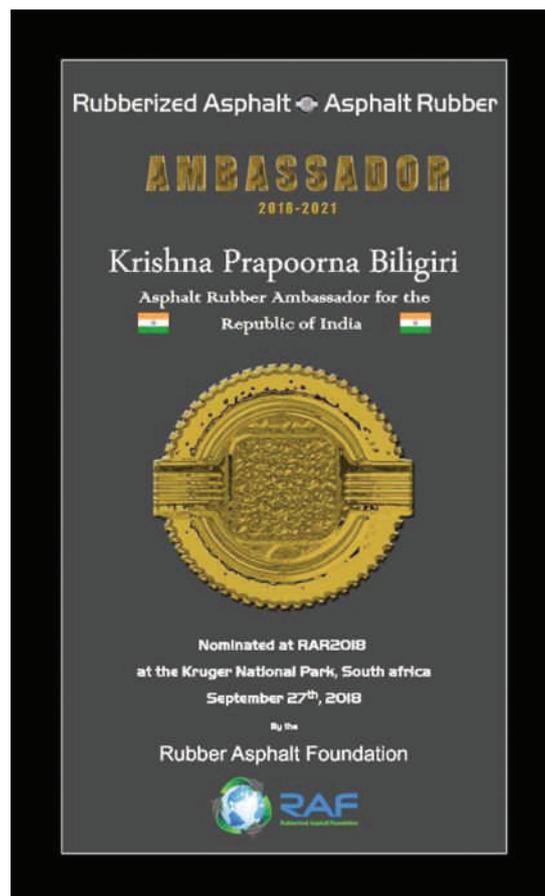
4.7 Awards & Achievements

1. **D. Mondal:** Short term academic visit to Faculty of Exact Sciences (Dr. Shlomi Reuveni's group), Tel Aviv University, Tel Aviv, Israel, 14 June -20 July 2018.
2. **H. Ramanan:** Served as one of the Judges for the Poster Sessions during the Indo-German Joint Scientific Workshop on "Membranes for Water and Energy," CSIR-Central Salt and Marine Chemicals Research Institute, Bhavnagar, Gujarat, India, 18-20 February, 2019.
3. **K. C. Kumar,** M.S. Scholar, Civil Engineering, received the Icon SWM-Excellence Paper Award 2018, for the paper "A Review of Studies on Environmental Performance Analysis of Construction and Demolition Waste Management Using Life Cycle Assessment" presented at the 8th International Conference on *Sustainable Waste Management*, at Acharya Nagarjuna University, Guntur, AP, India.
4. **K. Krishnaiah:** Received "Eminent Engineer's Award—2018" on the occasion of the 158th Birth Anniversary of Bharat Ratna Sir Mokshagundam Visvesvaraya, and 51st Engineers' Day on 15 September 2018 by the Institution of Engineers (India), Tirupati Chapter.



Maliyekkal S. M. receiving award from HRD Minister Dr. Harsh Vardhan

5. **K. P. Biligiri:** *Nominated as Asphalt Rubber Ambassador for the Republic of India* by Rubber Pavements Association and RAR-2018 Conference Chairmen, South Africa, for a period of three years, May 2018.
6. **K. P. Biligiri:** International Member, Standing Committees, Transportation Research Board of the National Academies of Engineering, USA, for a period of four years, 2018.
7. **P. Mohapatra:** Received Exemplary Reviewer Recognition from IEEE Wireless Communication Letters for High Quality Review Work from IEEE Communication Society, 2018.
8. **R. K. Sai S. Gorthi,** Litu Rout, and M. Deepak: Tracker ranked 13 in "Visual Object Challenge Results 2018", Proceedings: *Computer Vision – European Conference on Computer Vision (ECCV)*, Visual object Tracking Workshops, Munich, Germany, 8-14 September 2018.
9. **R. K. Sai S. Gorthi,** Priya M Raju, and M. Deepak: Tracker ranked 33 in "Visual Object Challenge Results 2018", Proceedings: *Computer Vision – European Conference on Computer Vision (ECCV)*, Visual object Tracking Workshop, Munich, Germany, 8-14 September 2018.
10. **R. K. Sai S. Gorthi:** Guided jointly with Dr. Sheeba R, INAE Innovative B.Tech Project award for Anupama Arun for Thesis "CS based MRI reconstruction".
11. **R. K. Sai S. Gorthi:** Guided, with Dr. M. Deepak, and Litu Rout, INAE Innovative B.Tech Project Award for Thesis "Boosting Visual Object Tracking performance using a stack of Machine Learning algorithms".
12. **S. Jain:** Received the best oral-presentation award for his co-authored paper titled, "Impact of Transportation Demand Management Policies on the Modal Share and Air Quality in Cities: Causes, Consequences and Effectiveness of Policy Options" at the International Conference on *Atmospheric Chemistry and Physics in Highly Polluted Environments (CIAAS-2019)*, held at IIT Delhi, 22-24 March, 2019.
13. **S. M. Maliyekkal:** As one of CO-PI received Project Award from the Hon'ble Union Minister for Science & Technology, Earth Sciences and Co-PIs Minister of Environment, Forests and Climate Change, Dr. Harsh Vardhan for the project WATER-IC for SUTRAM of EASY WATER at Indian Institute of Technology Madras, Chennai, 25 January 2019.
14. **S. M. Maliyekkal:** Research Excellence Award under the subcategory "Teaching Faculty" at the Institution of Engineers (India) and Fr. C. Rodrigues Institute of Technology (IEI- FCRIT) Excellence Award, Mumbai, January 2019.



4.8 Extension/Extracurricular Activities

1. **B. J. Ramaiah:** Doctoral committee member of Mr. Konichetty Vinay, School of Civil Engineering, Vellore Institute of Technology University, Vellore, 14 December 2018.
2. **B. Koteswararao:** Acted as adjudicator for DST- INSPIRE - Manak Program February 2019.
3. **C. S. Bahinipati:** Member of Doctoral Advisory Committee, Ashoka Trust for Research in Ecology & Environment, Bengaluru, 9 November 2018.

4. **C. S. Bahinipati:** Reviewer for 16 International Globelics Conference, Accra, Ghana, 24-26 October 2018.
5. **C. S. Bahinipati:** Reviewer for 4th International Research Symposium of Rajarata University of Sri Lanka – 'Investing in Biodiversity and Ecosystem Services (ISIBES 2018): Caring Nature-Creating Wealth', Sri Lanka, 17-18 October 2018.
6. **C. S. Bahinipati:** Reviewer for Adaptation Future 2018, Cape Town, South Africa, 18-21 June 2018.
7. **C. S. Bahinipati:** Reviewer for Journal of Environmental Management, Climate and Development, Land Use Policy, Natural Hazards, Water Policy, Climatic Change, Journal of Environmental Planning and Management, International Journal of the Commons, Journal of Social and Economic Development, Current Science.
8. **C. S. Bahinipati:** Contributing Author: "Adaptation to Climate Change in the Hindu Kush Himalaya: Stronger Action Urgently Needed", In: Wester, P., A. Mishra, A. Mukherji, A. Shrestha, 'The Hindu Kush Himalaya Assessment', Springer, pp. 457-490.
9. **Durga Prasad Challa:** Visiting researcher at Inverse Problems Group, Radon Institute (RICAM), Linz, Austria, 20 June - 17 July 2018.
10. **K. P. Naveen:** A visiting researcher at the Robert Bosch Centre for Cyber-Physical Systems at the Indian Institute of Science, Bangalore, Dec. 07 -14, 2018.
11. **K. P. Naveen:** Served as an adjudicator for the District Level School Exhibition and Project Competition, organized by INSPIRE MANAK, held at Sri Govindaraja Swamy High School, Tirupati, Jan 2019.
12. **P. S. Saikrishna:** Reviewer for finalizing the RFP's (request for proposals) for selection of the following under the *Smart City Mission (Tirupati)*: Electric Scooter, Rooftop solar system, Floating solar system (4MW) and Mechanised sweeping machines.
13. **S. Gorthi:** Served as a Jury Member for a National Level Project Expo cum Contest (AAVISHKAAR-2.0) conducted by Sri Venkatesa Perumal College of Engineering and Technology (SVP CET), Puttur, March 23, 2019.
14. **E. Anil Kumar:** Editorial board member for Wiley Journal "Energy Storage".
15. **E. Anil Kumar:** External Examiner for final M.Tech Thesis Evaluations for "Thermal Engineering" at VR Sidhartha Engineering College.
16. **E. Anil Kumar:** Member of Board of Studies, Madanapalle Institute of Technology & Science (MITS), Madanapalle, Andhra Pradesh, India.
17. **E. Anil Kumar:** Member of Board of Studies, Sree Vidyanikethan Engineering College, Tirupati, Andhra Pradesh, India.
18. **E. Anil Kumar:** Member of Research Advisory Board, Bannari Amman Institute of Technology, Sathyamangalam, Tamil Nadu, India.
19. **E. Anil Kumar:** Reviewer and External Examiner for a PhD Thesis work at IIT Bombay, "Effect of Additives, Heat Treatment and Mechanical Deformations on Hydrogen Storage Properties of BCC Alloys." at Energy Department.
20. **E. Anil Kumar:** Reviewer and External Examiner for a PhD Thesis work at IIT Guwahati, "Design Performance Assessments of Solar Driven Liquid Desiccant Air Conditioning System Components." at Mechanical Engineering Department.
21. **G. Ramakrishna:** External Examiner for MS Thesis Evaluation for "Generalized Representation for Large Road Networks - Mimicking Road User Behaviour and Achieving Improved Path Computation", at IIIT Hyderabad.
22. **K. P. Biligiri:** Advisory / Review Committee Member, 2-day National Conference on Transportation Research Efforts for Ecological Sustainability (TREES 2018), VNR Vignana Jyothi Institute of Engineering & Technology, Hyderabad, India, 28-29 September 2018.

23. **K. P. Biligiri:** Associate Editor, *International Journal of Road Materials and Pavement Design*, Taylor & Francis, UK, March 2019 – Present.
24. **K. P. Biligiri:** Editorial Board Member, *International Journal of Pavement Research and Technology*, Springer, USA, February 2019 – Present.
25. **K. P. Biligiri:** E-Life Member, Indian Roads Congress, New Delhi, India, June 2018 – Present.
26. **K. P. Biligiri:** Expert Member, Board of Studies, Siddharth Institute of Engineering & Technology (Autonomous), Puttur, Chittoor District, Affiliated to Jawaharlal Nehru Technological University Anantapur, Ananthapuram, Andhra Pradesh, India, March 2019 – Present.
27. **K. P. Biligiri:** Faculty Search Committee, VIT University, Vellore, India, August 2018.
28. **K. P. Biligiri:** Government of India Department of Science and Technology International Travel Grant Award, to participate in the International Road Federation Las Vegas Conference, USA, November 2018.
29. **K. P. Biligiri:** Lead Guest Editor, *Advances in Civil Engineering Materials*, American Society for Testing and Materials (ASTM) International, USA, Special Issue, 2016-18.
30. **K. P. Biligiri:** Lead Guest Editor, *Journal of Testing and Evaluation*, American Society for Testing and Materials (ASTM) International, USA, Special Issue, 2018-19.
31. **K. P. Biligiri:** Member and Session Chair, Scientific Committee, Rubberized Asphalt-Asphalt Rubber Conference 2018, Kruger Park, South Africa, 25-27 September 2018.
32. **K. P. Biligiri:** Member, Board of National Board of Accreditation, 2018 – Present.
33. **K. P. Biligiri:** Member, Scientific Committee, 2018 International Conference on Resource Sustainability (icRS 2018), Beijing, China, 27-29 June 2018.
34. **K. P. Biligiri:** Member, Scientific Committee, *Advances in Materials and Pavement Performance Prediction AM3P 2018*, Doha, Qatar, 16-18 April 2018.
35. **K. P. Biligiri:** Member, Scientific Committee, Chemo-Mechanical Characterization of Bituminous Materials, RILEM CMB Symposium, In conjunction with the RILEM Annual Meeting, Braunschweig, Germany, 17-18 September 2018.
36. **K. P. Biligiri:** Presiding Officer, TRB AFK50 Committee on Standing Committee on Structural Requirements of Asphalt Mixtures, Transportation Research Board of the National Academies, USA, January 2019.
37. **K. P. Biligiri:** Principal Coordinator, 3-Day Residential Training Program for Engineers of the State of Andhra Pradesh on “Roadway Construction Best Practices: Sustainability in Transportation Infrastructure”, Organized by Andhra Pradesh Human Resource Development Institute, Visakhapatnam, Andhra Pradesh, India, 21-23 June 2018.
38. **K. P. Biligiri:** Principal Guest Editor, *International Journal of Road Materials and Pavement Design*, Taylor and Francis, UK, Special Issue, 2017-19.
39. **K. P. Biligiri:** Recognized Reviewer, *Cement & Concrete Composites*, Elsevier, March 2019.
40. **K. P. Biligiri:** Recognized Reviewer, *Construction and Building Materials*, Elsevier, May 2019.
41. **K. P. Biligiri:** Recognized Reviewer, *Resources, Conservation and Recycling*, Elsevier, April 2018.
42. **K. P. Biligiri:** Session Chair & Speaker, IRF Global Road2Tunnel Conference & Expo, International Road Federation, Las Vegas, USA, November 2018.
43. **K. P. Biligiri:** Technology transfer of the implementation of pervious concrete pavements and parking lots, Indian Institute of Technology Tirupati, India, January 2019 – Present.
44. **R. K. Sai S. Gorthi:** Served as a selection committee member for the PMRF selections in Electrical Engineering discipline organized at IIT Kanpur, 30-31 May 2018.
45. **S. Jain:** Session Chair: *Indoor Environmental Quality Monitoring & Modeling and participated in an Asian Conference on Indoor Environmental Quality (ACIEQ 2019)*, Habitable Built Environment-Experience the Unseen, Indian Aviation Academy, Vasant Kunj, New Delhi, India, 1-2 February 2019.

46. **S. Jain:** Session Co-Chair and participated in 3rd *Indian International Conference on Air Quality Management (ICAQM 2018)*, Indian Institute of Technology Madras, India, 6-7 December 2018.
47. **S. Jain:** The Gendered Effects of Air Pollution: Gender and Economic Policy Discussion Forum, Forum XXVII, 5 October 2018. Briefing Note 27. Available at: http://182.71.188.10:8080/jspui/bitstream/123456789/940/1/the_gendered_effects_of_air_pollution.pdf
48. **S. M. Maliyekkal:** Academic Auditing of M. Tech Environmental Engineering Question papers, National Institute of Technology Trichy, India, March 2019.
49. **S. M. Maliyekkal:** Doctoral committee member of Mr. T Bharath Kumar, Vellore Institute of Technology University, Vellore, India, 4 January 2019.
50. **S. M. Maliyekkal:** External examiner for conducting the Viva- Voce Examination for M. Tech. Environmental Engineering students, National Institute of Technology Trichy, India, 9 January 2019.
51. **S. Chimalakonda:** Area Program Chair, ACM ITiCSE 2019, the 24th Annual Conference on Innovation and Technology in Computer Science Education, Aberdeen, UK, 2019.
52. **S. Chimalakonda:** Associate Editor, Software Quality & Software Reuse, IEEE Software Blog.
53. **S. Chimalakonda:** Domain Expert and Working Group 4 (Tools and Environment) Convenor of India Mirror Committee of ISO/JTC1/SC7 (Software & Systems Engineering).
54. **S. Chimalakonda:** Social Media Chair, ACM SIGSOFT, <https://www.sigsoft.org/contact.html>
55. **S. Chimalakonda:** Track Program Coordinator, Technology Enhanced Language Learning Track, 19th IEEE International Conference on Learning Technologies, Maceio, Brazil, 2019.
56. **T. S. Natarajan:** Invited as the Chief Guest during the Freshers Induction Programme of Annamacharya Institute of Technology & Sciences Tirupati.
57. **T. S. Natarajan:** Involved as a mentor and advisor in establishing Innovation Labs in 12 Government schools in Thiruvannamalai District of Tamilnadu under a CSR Programme of Bharath Petroleum Corporation Limited (BPCL).
58. **V. Badarla:** Member of Board of Studies, Computer Science and Engineering, KL University Vijayawada.
59. **V. Badarla:** Member of Board of Studies, Computer Science and Engineering, School of Engineering & Technology, Sri Padmavati Mahila Visvavidyalayam, Tirupati.
60. **V. Badarla:** Technical Program Committee Member for National Conference Communications (NCC) -2019.

5.

Memoranda of Understanding Signed by IIT Tirupati

MoUs and academic associations with the universities, research institutes and laboratories, and industry of international repute are prioritised at IIT Tirupati to nurture the collaborative academic and research activities. IIT Tirupati has inked Memoranda of Understanding with a number of institutions in India and abroad that aim 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.

Science City of Andhra Pradesh, Tirupati, and Indian Institute of Science Education and Research, Tirupati

IIT Tirupati entered into an MoU with Science City of Andhra Pradesh, Tirupati, and Indian Institute of Science Education and Research, Tirupati on May 04, 2018, to develop joint Masters and Diploma courses in '*high-end instrumentation*' which will serve for 'capacity building' and as a national resource in supplying well-trained technical work force in the proposed Inter-Institute Integrated Technology Programme to promote cutting-edge research.

CSIR - Central Road Research Institute (CSIR-CRRI), New Delhi

IIT Tirupati inked an MoU with CSIR-Central Road Research Institute, New Delhi on May 11, 2018, to promote intellectual cooperative research and scholarly exchange, and enhance high quality research acumen. The areas of collaboration mainly focuses on pavement engineering transportation materials and systems including planning, safety, environment, and other associated civil engineering areas such as bridges and geotechnical engineering.

CSIR - Structural Engineering Research Centre, Chennai

IIT Tirupati and CSIR-Structural Engineering Research Centre, Chennai signed an MoU on July 05, 2018 to establish a programme of exchange and collaboration on the matters of mutual research interest. The major thrust areas of research include health monitoring, assessment and extension of life of Civil and Mechanical Engineering Structural Systems.

Analog Devices India (ADI) Private Limited

IIT Tirupati entered into an MoU with Analog Devices India (ADI), Bangalore on July 09, 2018, to enhance collaboration in the areas of Digital Signal Processing and Communication. The goal of this MoU is to develop strategic partnership between IIT Tirupati and Analog Devices India to excel in innovation, education and talent development.

CSIR - National Environmental Engineering Research Institute, Nagpur

IIT Tirupati and CSIR-National Environmental Engineering Research Institute, Nagpur (NEERI) signed an MoU on the 3rd day of August 2018 in the spirit of intellectual and scholarly exchange. The major thrust areas of research are water and wastewater treatment, solid and hazardous waste management, air quality monitoring, modelling and management, environmental health and assessment, environmental impact assessment, climate science and policy, and sustainable development practices.

Ground Water and Water Audit Department, Government of Andhra Pradesh

IIT Tirupati entered into an MoU with Ground Water and Water Audit (GW&WA) Department, Government of Andhra Pradesh, on November 02, 2018 chiefly to promote academic collaboration between GW&WA Department and IIT Tirupati in the mutually beneficial areas of research. The major focus of the collaborative efforts will be on evaluating and developing techniques for groundwater sustainability in the face of increased demand for agricultural water and climate change.



CSIR - Central Electronics Engineering Research Institute (CSIR-CEERI), Pilani

IIT Tirupati and CSIR-Central Electronics Engineering Research Institute (CEERI), Pilani signed an MoU on November 12, 2018 to collaborate in the areas of mutual interest. The major thrust areas of research are cyberphysical systems, smart sensors, microwave devices with focus on flexible and non-Si Electronics, optoelectronics, smart infrastructure, energy, and internet of things (IoT).



Texas A&M Engineering Experiment Station (TEES)

IIT Tirupati and Texas A&M Engineering Experiment Station signed an MoU on December 17, 2018 for the academic collaboration in the areas of mutual interest. The major thrust areas of research are advanced manufacturing, materials, mechanics and cyber-physical systems. The MoU states that both the Institutions intend to jointly supervise the doctoral/masters/baccalaureate level students from both the Institutes, organize symposia, conferences, facilitate internships, disseminate research findings through scholarly publications, and would further promote the exchange of faculty and students in mutually agreed areas.



CSIR - Central Building Research Institute (CBRI), Roorkee

IIT Tirupati signed an MoU with CSIR-CBRI, Roorkee on January 10, 2019 chiefly to promote interaction between the two institutes in the mutually beneficial areas of Civil and Infrastructural Engineering. The principal areas of collaboration will include Structural Engineering, Seismic Microzonation, Geotechnical Engineering, Environmental Engineering, Building Science & Technology, Housing Systems, Geology and other areas of mutual interest to IIT and CSIR-CBRI. The MoU aims to initiate academic and research collaboration between the two institutions.

Toshiba Software India Pvt. Ltd

IIT Tirupati signed an MoU with Toshiba R&D India on January 10, 2019 to promote interaction between the two institutes in the mutually beneficial areas of artificial intelligence and data analytics. The principal areas of collaboration will include development of novel mathematical models and machine learning algorithms for studies on static and time series data arising in a multi sensor environment.

Central Manufacturing Technology Institute (CMTI), Bangalore

IIT Tirupati and CMTI Bangalore signed an MoU on January 22, 2019 to work together in mutual areas of interest. The major focus of this collaboration is in the areas of additive manufacturing, nano finishing, MEMS device development, ultra-precision machining, and ai techniques for vision based systems.

University of Calgary (Ucalgary)

An MoU was signed between IIT Tirupati and the University of the Calgary on January 30, 2019 to explore possibilities for collaboration and to strengthen friendly cooperation. The general purpose of this MoU is to facilitate mutually beneficial academic and research cooperation between the two Institutions which includes the following: Joint educational and research activities including applications for funding to promote these activities, exchange of visiting scholars for the purpose of conducting research, exchange of scholarly work, exchange of undergraduate and graduate students, exchange of faculty, and organising joint workshops and short programmes.

6. Academic Events

IIT Tirupati has been organising national and international level seminars, conferences, and workshops to facilitate the interaction of the faculty members and students of the Institute with the scholars from across the world. During the period under discussion, the Institute organised two international conferences, and four workshops along with an industry visit of faculty concerned. The Institute organised an orientation programme for providing an overview of the Institute and the curriculum for the third batch of students at the onset of new academic year.

6.1 Academic Orientation Programme

The Institute conducted its 4th Orientation Programme on August 8, 2018 to induct the 2018-2022 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 the Deans of the Institute.



Dean Academic Affairs addressing the students and their parents

6.2 Conferences, Seminars, and Workshops Organised

International Conference on Industry 4.0- Opportunities, Challenges, and Preparedness

Confederation of Indian Industry (CII) in collaboration with IIT Tirupati, and Texas A&M University, USA organised the Industry 4.0 Conference on December 17-18, 2018. About 240 delegates attended the conference from India and abroad. The sessions were held at the Hotel Marasa Sarovar Premiere, Tirupati.



International Conference on Atmospheric Chemistry and Physics in Highly Polluted Environments

IIT Tirupati jointly organised an International conference with IIT Delhi and CIAAS (The China India Association of Atmospheric Scientists) in Delhi on "Atmospheric Chemistry and Physics in



Highly Polluted Environments," during March 24-26, 2019. More than 180 delegates from across the world participated in it. The Directors of IIT Delhi and IIT Tirupati were patrons of the conference.

Workshop on Advances in Welding Technology

IIT Tirupati in collaboration with Indian Institute of Welding (IIW), Chennai Chapter organised a one-day workshop on "Advances in Welding Technology" in Sri City, Andhra Pradesh on November 22, 2018. Dr. Degala Venkata Kiran from IIT Tirupati coordinated the sessions for the welding engineers of the Industries located in Sri City. A total of 30 engineers participated in the workshop.



Workshop on Complex Analysis and Complex Dynamics

The Department of Mathematics organised a workshop on "Complex Analysis and Complex Dynamics for Teachers and Research Scholars" in collaboration with the 'National Board for Higher Mathematics' on December 10-22, 2018. Dr. Srijanani Anurag Prasad, and Dr. S. Rajesh convened the sessions for the participants. A total of 29 teachers and research scholars from different academic institutions participated in the workshop. The workshop was held in the IIT Tirupati temporary campus building.



Workshop on Academic Writing and Publishing

The Department of Humanities and Social Sciences organised a one-day workshop on "Academic Writing and Publishing" on December 17, 2018. Dr. Shashank Sinha, Publishing Director, Routledge, India, and Professor Sundar Sarukkai, IAS, Bengaluru conducted the sessions of the workshop as resource persons. Prof. Raghuramaraju and Dr. Bharath Kumar convened the event. The workshop was held in the IIT Tirupati temporary campus building.



Workshop on Wireless Connectivity through Edge Connectivity

K. P. Naveen, Electrical Engineering, co-organised a workshop on "Wireless Connectivity through Edge Connectivity," held in conjunction with IEEE International Conference on Advance Networks and Telecommunication Systems (ANTS), Indore, December 16-19, 2018.

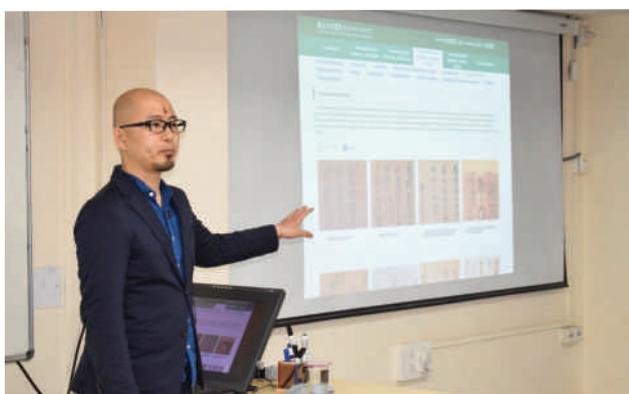
Workshop on Cybersecurity with Hands-on session

The Department of Computer Science and Engineering, IIT Tirupati organised a one day workshop on "Cybersecurity with Hands-on session" on 19 January 2019. Mr. Manjul Varma, Master security architect, HP India, delivered a series of lectures in the workshop.

6.3 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:

- Dr. Shrihari Sridhanran, Associate Professor of Mathematics at IISER Thiruvananthapuram, delivered a talk on "Random Dynamics Generated by Finitely Many Rational Maps", May 2, 2018.
- Prof. Kana Tomizawa, University of Shizuoka, Japan, delivered a talk on "Current Situation and Future Possibilities of Digital Humanities", July 10, 2018.
- Dr. Srinivas Padmanabhuni, Ex-President, ACM India, "Data Science for Software Engineering", September 14, 2018.
- Jitendra Theti, AVP at Aricent, "Cloud Computing", September 19, 2018. Dr. Ponnurangam Kumaraguru, IIT Delhi, "Social Media Analytics", September 26, 2018.
- Sachidananda S Javli, Director, Cyber Security, PwC India, "Cyber Security - Overview, Incidents Services, Risks in Evolving Technologies & Trends", October 5, 2018.
- Dr. Nishanth Chandran, Microsoft Research, "Many Faces of Cryptography", October 12, 2018.
- Dr. Sriram Chaudhury, Principal Consultant, Wipro, "An Overview of Natural Language Processing Tools and Applications", November 2, 2018.
- Derick Jose, Co-founder of Flutura Decision Sciences, "Future of AI, and How can Students Enhance their Placement Outcomes?", November 16, 2018.
- Dr. Sumanta Mukherjee, Research Scientist, IBM Research, "Machine Learning & Interpretability", November 30, 2018.
- Professor Sonia Sikka, University of Ottawa delivered a th lecture on "Faith, Identity and Reason" on 28 January 2019 commemorating International Philosophy Day.
- Dr. Pratap Sriram Sundar, CEO and Chief Consultant, Natura Consultancy Services Pvt Ltd, "Technology Enablers for the th Circular Economy" 13 February 2019.
- Mr. Ragu Ragunathan, PMP, CISSP, CISA, Principal Cybersecurity Consultant, USA, delivered a talk on "Cybersecurity: Challenges and Opportunities" 4 Febraury 2019.
- Prof. Sayantan Majumdar from Raman Research Institute, Bengaluru, delivered a talk titled "Dynamic jamming in dense particulate suspensions" 28 January 2019.
- Dr. Arun Sehrawat from Harishchandra Research Institute, Prayagraj, delivered a talk titled "Allowed region of the mean values of angular momentum observables and their uncertainty relations" 11 February 2019.



- Dr. Miyamoto Takashi, University of Tokyo, "Institutional and Grass Roots Digital Archives in Japan" 6 March 2019.



- Professor Mark Fox, University of Toronto "Accountable AI Systems" 11 March 2019.

- Prof. Anil Prabhakar from Indian Institute of Technology Madras delivered a talk titled "Securing data in transit with quantum optics" 15 March 2019.
- Prof. S.T. Manson, Georgia State University, delivered a talk on "Correlation in Atomic Processes: Electrons Really do Communicate with each other" by 22 March, 2019.
- Dr. Mangala Narlikar delivered a talk on "Application of Number Theory to Create a Secret Code" March 29, 2019.
- Dr. Sudarshan Tiwari delivered a talk on "A Meshfree Particle Method for Simulations of Fluid Flows and Interacting Particle Systems" November 30, 2018.
- Dr. P. Vasudev Shetty, MD DM Cardio from DVR & SK Super Specialty Hospital, conducted a Health Awareness session on "Hypertension" August 28, 2018.

6.4 Distinguished Lecture Series

IIT Tirupati started a 'Distinguished Lecture Series' on 7 January 2019 with the inaugural lecture by Professor Rajmohan Gandhi, a well-known Historian & Biographer, on 'South India's Role in the Story of India'. The distinguished lecture series aims to invite the eminent scholars from across the country to enlighten IIT Tirupati fraternity. Professor G. Baskaran, Theoretical Physicist, Institute of Mathematical Sciences, Chennai was invited to deliver the second lecture of the series on 12 March 2019 on the topic "A Quantum Leap and a Bright Future". The third lecture was delivered by Prof. Jayant V. Narlikar, Emeritus Professor, Inter-University Centre for Astronomy and Astrophysics, Pune, on the topic "How Well Do We Know Our Universe?" on 29 March 2019.



6.5 Visit to Food Processing Unit by Faculty Members

To develop an understanding of the challenges faced by the food processing industries, a team of faculty members with research interests in food and agriculture led by the Director, Prof K. N. Satyanarayana and Mr. N.L.B Pantulu, Senior Consultant with the AP Food Processing Society, visited Jain Food systems and Food and Inns processing plants located near Chittoor on November 3, 2018.



6.6 Summer Internship

The Institute gives high priority to the summer internships for the students that complement the knowledge gained at the Institute by providing them hands on training. It also provides students an opportunity to feel the work environment of an organisation. IIT Tirupati ensured a quality internship to 100% of its 3rd year students, in India and overseas.

7. 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 organized the second performance of SPIC MACAY on the Institute campus. Further, the Institute celebrated the third Institute day during this period. This section of the report details about the various events organised by the Institute during the year 2018-19.

The Third Institute Day

The third Institute Day of IIT Tirupati was celebrated on April 4, 2018. Mr. Anil Kumar Singhal, IAS, Executive Officer, Tirumala Tirupati Devasthanams, was the chief guest of the event. Prof. K. N. Satyanarayana, Director, IIT Tirupati, presided over the function. The event formally began with the welcome address by Prof. K. Krishnaiah, Dean, Academic Affairs, followed by the speeches of the chief guest, and the Director. The students gave excellent cultural performances on the occasion. The chief guest awarded the medals to the toppers of the various branches, and distributed prizes to the winners of various events held during the year. The vote of thanks was proposed by Dr. N. Venkaiah, Associate Dean, Student Affairs.



IIT Tirupati Launches its Logo

On the occasion of its third Institute Day, IIT Tirupati launched its logo that is designed by National Institute of Design, Ahmedabad, in consultation with all the students, faculty, and staff members. For the thematic descriptions of the logo, please visit- <http://iittp.ac.in/aboutlogo>



72nd Independence Day Celebrations on the Permanent Campus

The first celebration on the permanent campus of IIT Tirupati was the 72nd Independence Day. The celebrations commenced 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, and competitions on the theme of national unity in the Indoor stadium of the Institute.



Teachers Day Celebration

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

70th Republic Day Celebrations on the Permanent Campus

IIT Tirupati celebrated the 70th Republic Day on 26 January, 2019 on the permanent campus. 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 relating to the national unity and love for the country.



SPIC MACAY

The second performance of SPIC MACAY Heritage club to promote the Indian classical music among the youth was organised on November 13, 2018. Sri Sikkil Gurucharan gave a Carnatic Vocal Lecture Demonstration accompanied by Sri V Sanjeev on Violin and Sri Akshay Ananthapadmanabhan on Mridangam.



International Yoga Day Celebrations

June 21st, 2018 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 the different asanas along with being introduced to the benefits of those yoga asanas. Yoga instructor Mr. Jampala Srinivasa Rao through his talk and demonstration motivated the faculty and students to pick up this healthy habit.



Shri N. Amaranatha Reddy, Hon'ble Minister for Industries and Food Processing visited IIT Tirupati

Food & Agricultural Technology has been identified as one of the thrust areas for research and development by the Institute. To discuss with the Director and the faculty members on how IIT Tirupati can contribute to the state initiatives in Food Processing and Agriculture, Shri N. Amaranatha Reddy, Hon'ble Minister for Industries and Food Processing, Govt. of Andhra Pradesh along with Mr. Y. S. Prasad, CEO, A. P. Food Processing Society and Mr. Preetham Reddy, Industries Special Representative, visited the Institute on October 8, 2018.



8. 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 hired another building adjacent to the existing one on rent to accommodate the increasing number of research scholars and faculty members. IIT Tirupati, in the fourth year of its operations, has started functioning from its 530 acres Permanent Campus located in Merlapaka Village on Yerpedu-Venkatagiri Highway. The construction of the Permanent Campus is underway and the 'Stage 1 A (Transit Campus)' of the first phase of the campus has already been completed. The complete campus to cater to 2,500 students, 250 faculty members and 275 staff members is planned to be built by 2024. 'Stage 1 A (Transit) Campus' of the Institute has won the Exemplary Performance Award from GRIHA Council, New Delhi, and the first prize in the HUDCO Design Awards – 2018 for the design and construction of an eco-friendly campus with sustainable construction materials and technologies. This chapter reports about the progress made in the campuses of the Institute during the period under consideration.

8.1 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.



A view of the temporary campus, IIT Tirupati

Following are the facilities that are available on the temporary campus:

<ul style="list-style-type: none"> ■ Auditorium - 200 Seater 	<ul style="list-style-type: none"> ■ Physics Laboratory
<ul style="list-style-type: none"> ■ National Knowledge Network (NKN) Virtual Classroom 	<ul style="list-style-type: none"> ■ Chemistry Laboratory
<ul style="list-style-type: none"> ■ 30 Seater Class room - 2 nos. 	<ul style="list-style-type: none"> ■ Workshop
<ul style="list-style-type: none"> ■ 60 Seater Class room - 8 nos. 	<ul style="list-style-type: none"> ■ Computer Laboratory
<ul style="list-style-type: none"> ■ 120 Seater Class room - 1 no. 	<ul style="list-style-type: none"> ■ Innovation Laboratory
<ul style="list-style-type: none"> ■ Faculty Cabins and Lounge 	<ul style="list-style-type: none"> ■ Kitchen-cum-Dining Facility
<ul style="list-style-type: none"> ■ Guest Faculty room 	<ul style="list-style-type: none"> ■ Cafeteria
<ul style="list-style-type: none"> ■ Staff room 	<ul style="list-style-type: none"> ■ Gymnasium
<ul style="list-style-type: none"> ■ Research Scholars room 	<ul style="list-style-type: none"> ■ Passenger Lift
<ul style="list-style-type: none"> ■ Meeting rooms 	<ul style="list-style-type: none"> ■ 24x7 - 365 days DG Backup for entire campus
<ul style="list-style-type: none"> ■ Board room 	<ul style="list-style-type: none"> ■ RO system (2x500 Litres per hour)- For the purpose of drinking and cooking
<ul style="list-style-type: none"> ■ Centralised Wi-Fi 	<ul style="list-style-type: none"> ■ Outdoor and Indoor sports facilities
<ul style="list-style-type: none"> ■ Administration Office 	<ul style="list-style-type: none"> ■ Necessary facilities have been provided for physically challenged access.
<ul style="list-style-type: none"> ■ Electronics Laboratory 	

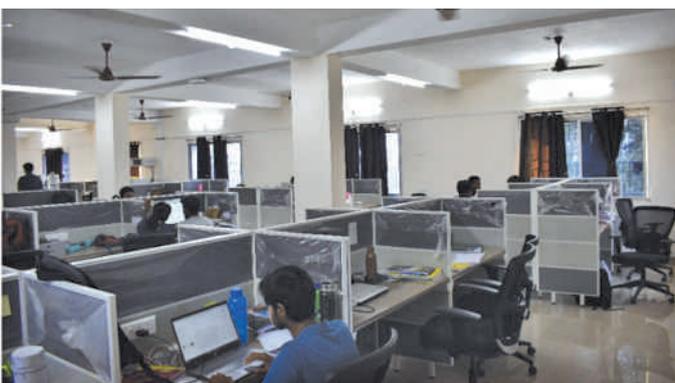


A view of the Annexe Building

Annexe Building

In order to meet the additional space requirement for the increased strength of faculty members and research scholars, the Institute has 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.



A view of the cubicles for Research Scholars

Student Hostels & other Facilities

IIT Tirupati constructed four Hostels for boys and one Hostel for Girls on the Permanent Campus in Yerpedu. The total seating capacity of boys-hostels is 600 and the seating capacity of Girls-Hostel is 120. All B. Tech and M. Tech Students have been accommodated in these hostels. In addition to it, IIT Tirupati also hired two buildings in the vicinity of temporary campus at Lakshmipuram Colony to offer hostel accommodation to MS and PhD students. 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 its own primary care health centre on both temporary and permanent campuses, and has also signed an MoU with a Multi-Specialty Hospital in the town to provide students with cashless treatment.



An aerial view of the hostels on the permanent campus

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.



Hostel in Lakshmipuram Colony

Sports facilities

An indoor stadium along with outdoor sports facilities has also been created for the students.

Outdoor sports facilities:

- Basketball court with Poly Propylene Tiles
- Two volleyball courts

- One Tennis court and half practice court
- Running track cum football / Cricket Ground

Indoor sports facilities:

- Three badminton court with vinyl flooring
- Table tennis
- Gym



View of Indoor and Outdoor sports facilities

Health Centre

IIT Tirupati has its own primary care health centre on both temporary and transit campuses with two qualified doctors, namely, Dr. Swetha M.B.B.S, D.G.O & Dr. K.V. Rama Rao M.B.B.S, D.N.B, FCD supported by well trained staff nurses and 24*7 ambulance service with in the campus.

Good quality primary care is provided in emergencies includes basic life support-CPR, Defibrillator etc. All common diseases like viral fever, migraine, sports injuries are treated. There are facilities like wheel chair, stretcher for transport patient, autoclave for instruments sterilization; oxygen cylinders for oxygenation, nebulizers, ECG machine, adjustable hospital beds, anti-snake venom and anti-Rabies Vaccine.

We have MOU's with Helios Multi-speciality Hospital, Sri Rama Devi Multi-speciality Hospital and SVIMS Super Speciality Hospital for higher referral services. There is an MOU with Apollo pharmacy at Korlakunta for purchase of all types of medicines. The health care team gives health education to prevent communicable diseases and non-communicable diseases.



A view of Health Centre

Guest House Facility

To cater to the need of the guest house, the Institute has hired five flats in KCR Tower apartment complex. For the purpose, 6 occupancy and 4 occupancy air-conditioned rooms with Wi-Fi and other required facilities are made available for the guests of the Institute. On the permanent Campus of the Institute, two double occupancy air-conditioned rooms are available. The guest house has a kitchen-cum-dining hall. Apart from the above, two fully furnished apartments are made available to visiting faculty.



Guest house facility at KCR Towers



Guest House facility on permanent campus

8.2 Permanent Campus

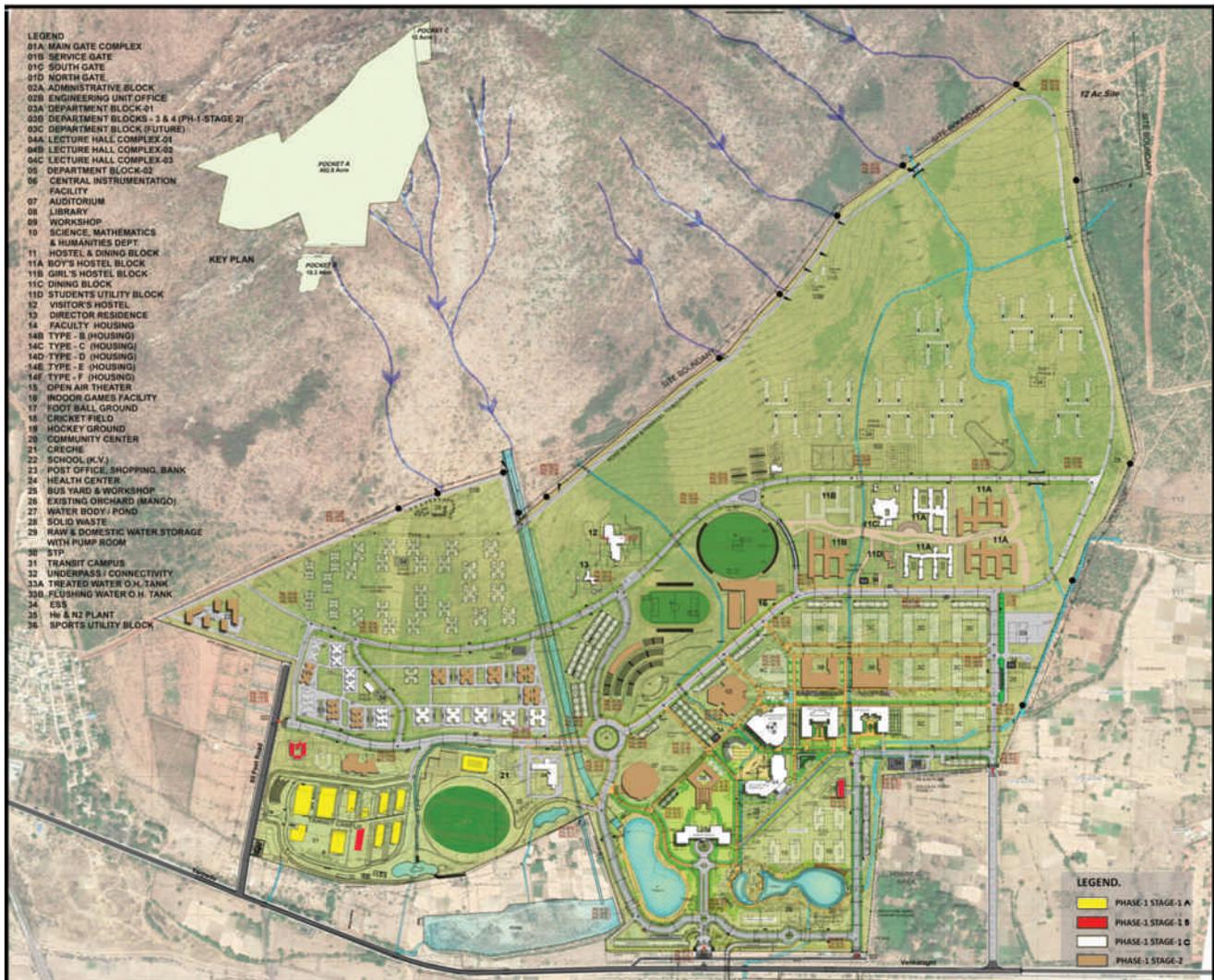
The Government of Andhra Pradesh provided land to the Institute to an extent of 548.49 acres for the development of the permanent campus located on the Yerpedu–Venkatagiri Highway in Merlapaka Village. The permanent campus site is 24 km from Tirupati town, 14 km from Renigunta Railway Station and 13 km from the Tirupati Airport. The construction of the compound wall around the site is completed.

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 :

Salient features of the Master Plan

- The site is bifurcated by a national highway. The west campus (529 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 rivulets 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.



Master Plan, IIT Tirupati

- The locations of the buildings and other facilities are planned to minimize the cuts and fills in the site.
- The buildings are oriented to minimize 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 2021, buildings and facilities to cater to 1250 students and 100 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.

Permanent Campus Phase-1 Stage 1A Construction (Transit Campus)

The buildings and facilities on the permanent campus Stage-1A construction 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 lab, 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



An aerial view of the Phase -1, Stage 1A of the permanent campus

The construction of transit campus includes following sustainable Eco-Friendly Features

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

IIT Tirupati Transit Campus Project bagged GRIHA Council Exemplary Performance Award and First Prize in HUDCO Design Awards - 2018

IIT Tirupati Transit Campus Project received the Exemplary Performance Award under the category Sustainable Materials and Technologies by Green Rating for Integrated Habitat Assessment (GRIHA) Council for the design and construction of an ecofriendly campus with sustainable construction materials and technologies. The award was received by the Director on December 12, 2018 in the 10th GRIHA Summit held at New Delhi, India.

Also, the Campus Project secured the first prize in the HUDCO Design Awards - 2018 given by Housing and Urban Development Corporation (HUDCO), under the category 'Green Buildings' for the design and construction of an eco-friendly campus with sustainable construction materials and technologies.



Permanent Campus Phase-1 Stage 1B Construction (Class Room Building, EU Office, Hostel Block-F)

- A Class room building (G+2) having 13 class rooms including 8 numbers of 40 seater class rooms, 4 numbers of 60 seater class rooms, 1 number of 120 seater class room.
- The Stage 1 C construction is going to start in December 2019. To accommodate the CPWD officials, architects and IIT Engineering unit staff, a (G+1) floor building.
- A hostel block to house about 200 students.
- To meet the immediate requirement on building infrastructure, the above three building have been taken up, and the construction is in progress.



Foundation work of class room complex

9. Student Events

In addition to their regular course of academic affairs, the students at IIT Tirupati are 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 the following events and activities organised by the students:

- (a) Technical and Techno-Cultural events
- (b) NSS activities
- (c) Student clubs and sports related activities

9.1 Technical Events

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

IIT Tirupati Secured 8th Position in the 7th Inter-IIT Tech Meet- 2018

IIT TIRUPATI secured 8th position in Overall General Championship in the 7th Inter IIT Tech Meet 2018 surpassing all the second and third generation IITs. A contingent of 28 students from IIT Tirupati participated in this Inter IIT Tech Meet that was held at IIT Bombay from 18th to 20th December 2018. IIT Tirupati claimed two gold medals and one bronze medal. In PlutoX Hackathon, IIT Tirupati alone got the gold medal.

IIT Tirupati Student Team Wins a fully Paid Trip to ESIGELEC, France

A team of students comprising second year students V. Dheeraj, Surya Ganesh Vadhri, KHDS Uday Krishna, AVSK Chaitanya won the competition "Make Your Robotik" in October 2018 conducted by a France based institute named ESIGELEC and Manipal Institute of Technology. The team stood first surpassing 51 teams from across the country, and won a fully paid trip to ESIGELEC in France.

Smart India Hackathon - 2019

The team Beginner's Luck Strikes from IIT Tirupati (Mr. Gowtham Senthil, Mr. Aravindh Rajiv, Mr. Nandhakumar K, Mr. Abishekh P, Mr. Koushik K S, Ms. Rishitha Reddy) won the first prize of Rs. 1 Lakh and a shield for the problem statement "App Based Solution for Digitization of Valuation of Mobile Assets" in Smart India Hackathon 2019.

On-Campus Events

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

9.2 Tirutsava - 2019: The Second Techno-Cultural Fest

Tirutsava - 2019, held on 1-3 February 2019 was the second edition of the techno-cultural fest of IIT Tirupati. It witnessed enthralling cultural performances like fire dance and laser dance which left the audience awestruck. Students showcased their technical expertise and came up with innovative ideas by participating in a wide array of technical events conducted during the course of a 2-day festival. Several students from all over Tirupati attended the workshops conducted around the latest themes in the technological frontier like machine learning and artificial intelligence. The performances by Lagori, a Bangalore based rock band, and the DJ night were crowd pullers. The citizens of Tirupati thronged to both the events in large numbers to thoroughly enjoy the weekend. Overall, Tirutsava was truly the efforts of several teams of students who seamlessly worked together to make it a massive success.



9.3 National Service Scheme (NSS) Activities

Sarvam, Puducherry

Two students from the Institute, Aman Singh and Anup Kulkarni, travelled to Puducherry and tutored students at the Summer Camp organised by Sarvam, Sri Aurobindo Society from 15th May to 18th May, 2018. The students demonstrated a plethora of experiments and tricks encompassing Science and Mathematics.

Arduino Workshop at Regional Science Centre, Tirupati

NSS student volunteers of the Institute organised a two-day Arduino workshop for local school students along with Regional Science Centre, Tirupati. This event was organised on 19th and 20th of January 2019 at Regional Science Centre. This workshop evoked good response from the local schools and large number of students participated in the workshop.



Demonstrating experiments to the Tamil Nadu Governor visiting the camp



Development of De-weeding machine

NSS volunteers of the Institute started working on the development of a de-weeding machine for paddy crop with inputs from local farmers. Students interacted with farmers from the villages near the campus to know the requirements and started working on this project.



Swatch Bharath Activities in nearby Villages

Students participated actively in Swachatta awareness campaigns and clean up drives in colonies and villages near to the campus. They not only took up cleaning drives but also explained the local people regarding the importance of the cleanliness and hygiene through interactions and street plays.



Plantation drives in Panguru Village

NSS volunteers of the institute conducted a plantation drive in Panguru and Jangapalalle villages in March 2019. They made plant guards from the waste packaging material available at the institute to protect the plants from animal.



9.4 Student Clubs and Activities

The student clubs play a pivotal role in organising events to extend life beyond the boundaries of text-books and promote extra-curricular development. A number of events were organised by the different clubs of the students during the session 2018-2019.

ACTOMANIA

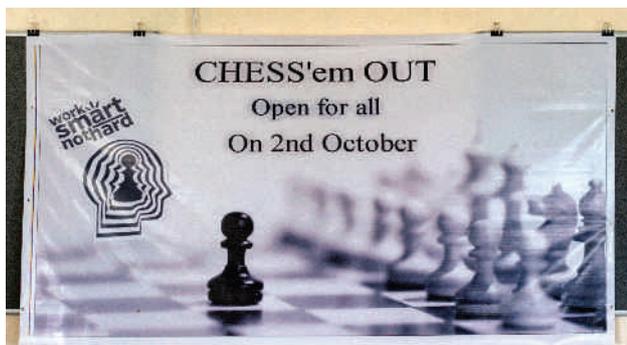
"Actomania" – the drama club engages students and brings out a juxtaposition of their on-stage, impromptu skills as well as their creative writing skills. Throughout the academic year, the club organized many such events which promoted participation among students. Contests like Dubsmash required participants to dub their voices in sync with a soundbite from a movie or a song; Pen it Down made students hone their writing skills by writing stories based on the contemporary issues. Other events like monologue, a skit based on an adaption of a play by Fritz Kerinthy were also performed.



Actomania collaborated with PFC to produce a short film "False Move", proving their mettle in film-making. The club also proactively engaged in the promotion of Tirutsava through their first-ever street play at Shilparamam, Tirupati.

Chaturanga Club

Chaturanga, the chess club of IIT Tirupati believes in shaping patzers into masters. The idea behind a chess club is to sharpen logical thinking and cognitive abilities. The first event for this semester, "Chess 'em out" was a one-on-one Swiss type match where each participant gets twenty minutes without Fischer time. After facing stiff competition, A.Sathvik, Madhavan and Sree Charan came first, second and third respectively. Another event was organised adhering to the Inter IIT rules and regulations, where each participant gets an ample time of forty-five minutes. Deep, Hrishikesh, Manish and Sumanth emerged as winners.



Artista

The art club, which caters to the talents in painting, sketching, craft, brings out the creative side of the students. In addition to the conventional fine art forms like glass/ canvas painting, this year students took up wax carving, charcoal art and diya decoration to display their flair for the arts. Students also participated in various events like costume designing, live sketching, charcoal art in the Inter IIT Cultural Meet organised by IIT Roorkee.



Photography and Film Club (PFC)

The Photography and Film Club of IIT Tirupati extensively organises events throughout the year. Besides photography contests based on themes like "Minimalism" and "Shadows", it also organised an activity on long exposure photography and another on single colour photography. The club has also successfully collaborated with the drama club "Actomania" to make short films titled "False Move", "Into the Dream". PFC along with Actomania has



also made a film titled "A Man's Legacy v/s Life" for a 48-hour film making contest- one of the biggest in Asia.

Besides all these club-oriented activities, PFC has captured and processed countless emotions, actions at different events, special talks, cultural programmes etc.



Sargam

The music club of IIT Tirupati encouraged the students by introducing a new teacher to train students in Carnatic music. Sargam also successfully organized a hands-down workshop on music theory and synthesizer. The club members participated in events across the calendar like Independence Day, Republic Day and Institute Day.



XCITE

XCITE, the dance club, aims to acquaint the students with the dancing skills and value of dance in their personality development. There are more than 40 active members in the club. The members perform versatile dance forms like hip-hop, freestyle, Bollywood, folk dance, popping and many more. For the first time, the club organized an online dance competition "Step It Up". In order to promote the cultural fest "Tirutsava", members and club coordinators performed in flash mob across the city.



Aranya

Aranya, the trekking club incites the adventurous spirit among the students. Treks are organised keeping in mind the safety of the students. Tirupati, surrounded by the Eastern Ghats has a number of places suitable for trekking. The Aranya Club on its



first trek for the semester had a 150+ turnout including students, staff and faculty. Subsequently, two other treks were organised to Tada Falls and Sadashiv Kona Falls respectively. The club coordinators, initiated a photography competition as a follow up to the trek.



Coding Club

This year the primary focus of the coding club was competitive coding. A number of events and activities were strewn across the academic calendar. A coding competition was conducted for freshers, to help them to understand the coding culture in the Institute. Workshops on C++ and Ethical hacking witnessed students from all streams participating. IIT Tirupati became an active member of the Google DSC (Developer Student Club). The main objective of Google DSC was application development for which 6 workshops lasting 8 hours per session were conducted. The year ended with a summer project on application development. In addition to that, the ACM student chapter organised advanced programming language workshops. The robotic club, a subsidiary unit of the coding club, organized an introduction to Arduino workshop for the Freshers' and helped in various projects, mostly done by the students in their first and second years.

Quiz Club

The quiz club enhances the curiosity and the knowledge of trivia among students, encouraging them to learn more, know more and spread the acquired knowledge. Besides informal events, the quiz club formally began its activities as an independent club from this academic year. Quiz competitions were conducted on Independence Day and during the annual cultural festival- Tirutsava.

Freshers' Night

The newcomers to the Institute were welcomed by the seniors with a series of programmes and competitions like tug of war, box cricket, clipslam and meme challenge. The Freshers' Night "AAGMAN" 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 were selected for the title of Mr. Fresher and Miss Fresher respectively, which also marked an end to the event.



Other Activities

The institute is a vibrant site of multiculturalism and hybridity which was marked by the first ever Ethnic Night and Cultural Night celebrated along with a traditional Dandiya Night. Besides national events like Independence Day and Republic Day, Ganesh Chaturthi was celebrated to bring out the religious fervor among the students. Sankranti was also celebrated by flying colourful kites and lighting a bonfire.



9.5 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.

7K Fun Run

Teachers, students and staff of IIT Tirupati went for a 7K FUN RUN on 12th August 2018 at the site of the permanent campus. This run, in true sense, was a fun for all the members of IIT Tirupati family. This run was actually organised to familiarise the newly inducted students of the Institute with the permanent campus site.



Gymkhana Club Sports Meet

Gymkhana Club conducted intramural sports meet from February to April 2019. Students were divided into four houses namely Titans, Mavericks, Warriors and Dynamites. Various games and events were conducted for men and women like Badminton, Basketball, Cricket, Football, Table Tennis, Volleyball, Throw ball and

Athletics. Finally, the Mavericks house won the overall championship. B. Nitish Kumar (Final year, Mechanical) and S. Spandana (Second year, Civil) were declared the best athletes among men and women, respectively.

53rd INTER-IIT Sports Meet

A contingent of students from IIT Tirupati participated in the 53rd Inter-IIT Sports Meet at IIT Guwahati from December 14 – 21, 2018. The proportion of girl participants from the Institute was more than any other IIT (9 out of 41 participants). Apart from athletics, IIT Tirupati students participated in cricket, badminton and basketball (men and women). Notable among them was Sanugula Spandana (Second year, Civil Engineering), who finished fourth in the women's high jump event with a jump of 1.20 m.



25th INTER-IIT Staff Sports Meet

Faculty and Staff members from IIT Tirupati participated in various sports events of the 25th Inter-IIT Staff Sports Meet at IIT Guwahati from December 24 to 28, 2018.

GCU- Guidance and Counselling Unit

The Guidance and Counselling Unit also known as *Sarathi* is a pivotal student body which aids the mental health of the Institute. The unit organized a number of events to take care of the emotional well-being of students. In collaboration with the start-up YourDOST, GCU organized training sessions for faculty and students as well as an orientation session for freshmen. *Sarathi* also organized an interactional day between faculty and students, Sanlaap. There were several other events conducted like a 15-day Yoga workshop, a five-day Art of Living workshop and a mental health campaign on the occasion of Mental Health Day.





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