



# HINDUSTAN

INSTITUTE OF TECHNOLOGY & SCIENCE  
(DEEMED TO BE UNIVERSITY)

## RESEARCH BROCHURE



2024

[www.hindustanuniv.ac.in](http://www.hindustanuniv.ac.in)

“Every human being has infinite potential. The role of an educator is to bring out the best in every individual; and that of an educational institution, to provide the best facilities and the right ambience”

## Founder - Chairman

Hindustan Group of Institutions



**Late Dr. K. C. G. VERGHESE**

(1940-2006)

**FOUNDER'S VISION** To Make Every Man a **Success**  
and No Man a Failure

“

*Hindustan  
Institute of  
Technology  
and Science  
takes  
confident  
steps towards  
being a  
pioneer in  
research  
activities;  
and be able  
to produce  
knowledge  
build on it for  
the sake of  
human kind.*

”



## Chancellor's Message

The advancement in scientific and technological research has a significant impact on the future of our nation. Our country has made an immense contribution towards introducing the foremost concept of University system to the world by establishing the world's renowned ancient universities like Nalanda and Takshashila-Citadels of Higher Education, centuries prior to the rest of the nations. The proof of our age old prowess in Mathematics, Science & Technology in the country is evident from the words of the renowned scientist Albert Einstein, "We owe a lot to the Indian who taught us how to count, without which no worthwhile scientific discovery would have been made. Research and innovation must be prioritized for addressing myriad problems our country faces now. It is also imperative that industry and academia should operate in tandem to create the right synergies for promoting industrial growth and academic rejuvenation."

The Hindustan Institute of Technology and Science (HITS) is one of the premier institutions in the country focusing on outstanding academic with an emphasis on fundamental and applied research to position itself as one of the leading research Universities in Asia. It takes courageous strides in pioneering research activities and be able to produce knowledge to serve humanity. Further, HITS has established itself as one of the front line institutions in India in the field of Engineering and Technology education. It also keenly looks forward to becoming one of the best Research Oriented Institutions in the country in the near future. To expedite this process, a number of research projects have already been funded by the various Government Funding Agencies such as Science and Engineering Research Board, Department of Science & Technology, Atomic Energy Regulatory Board, Department of Atomic Energy, Indian Council of Medical Research, Defense Research & Development Organization (Naval Research Board), Ministry of New & Renewable Energy, Aeronautics Research and Development Board, Global Innovation & Technology Alliance to name a few.

HITS has already established various Centres of Excellence across Departments. The Centres provide cutting-edge facilities with rich content and also offer a wide range of opportunities to the research scholars. The University currently has more than 600 Scholars doing research. Most of our faculty members are already undertaking scholarly activities and have more than 5,500 publications in its record in a multitude of Journals and Research papers presented at various Conferences. The Institution so far has filed 260 patents and some are in the pipeline. Recently, HITS inked Memorandums of Understanding (MoU) for collaboration with two of our nation's most esteemed schools, IIT Madras and IIT Roorkee. This brochure reflects necessary information about various research activities, which will be valuable to the prospective scholars.

I am certain that all our efforts and commitment will increase the output of the city to benefit the students, society and the nation at large.

**Dr. Anand Jacob Verghese**

Chancellor

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FOUNDER'S BLOCK  
Dr. K.R. VERGHESE RESEARCH & INNOVATION CENTRE

INSTITUTE OF AVIATION AND SPACE

# MOTTO, VISION, MISSION AND VALUE STATEMENT



## Motto

To Make Every Man a Success and No Man a Failure

## Vision

To be an International Institute of Excellence, providing a conducive environment for education with a strong emphasis on innovation, quality, research and strategic partnership blended with values and commitment to society.

## Mission

- ▶ To create an ecosystem for learning and world class research.
- ▶ To nurture a sense of creativity and innovation.
- ▶ To instill highest ethical standards and values with a sense of professionalism.
- ▶ To take up activities for the development of the Society.
- ▶ To develop national and international collaborations and strategic partnership with industry and institutes of excellence.
- ▶ To enable graduates to become future leaders and innovators.

## Value Statement

Integrity, Innovation, Internationalization.



**HINDUSTAN INSTITUTE OF TECHNOLOGY & SCIENCE (HITS)**, is one of the pioneering institutions in India, located in Chennai, Tamil Nadu. Commenced in 1985, it offers a wide spectrum of Undergraduate, Postgraduate, Diploma, Research & Doctoral Programmes in diverse fields of Engineering, Technology, Architecture, Management, Law, Fashion Design, Aviation, Applied Sciences, Allied Sciences, and Arts and Sciences. HITS is recognized as Deemed to be University by UGC in 2008 and received Category-II status from MHRD which empowers HITS with Academic Autonomy. The technical courses at UG and PG levels are approved by AICTE. NBA has certified seven undergraduate programmes such as Aeronautical Engineering, Aerospace Engineering, Computer Science and Engineering, Electronics and Communication Engineering, Electrical and Electronics Engineering, Information Technology and Mechatronics Engineering. HITS is a part of the most illustrious Hindustan Group of Institutions which caters to the academic needs of over 20,000 students.

HITS is acclaimed with several notable accolades and rankings across the globe. Nine engineering programmes were accredited by the world's leading professional organisation – the Institution of Engineering and Technology (IET) as well as seven engineering programmes by the National Board of Management. On rankings, QS Asia University Rankings for 2023 has placed HITS at 40th Rank in India, 3rd rank for staff with Ph.Ds., overall ranking 601-650 band, #160 in Southern Asia. HITS is certified with QS Advanced ELED Certification pertaining to Learning Excellence in Academic Digitization. Times Higher Education (THE) for UN-Sustainable

Development Goals has placed HITS in 600-800 in global rankings. NIRF 2023 rated HITS Engineering in 101-150 band, Management in 101-125 band, University 101-150 band; HITS achieved Diamond band by Sustainable Institutions of India (SII) Green Ranking 2023.

HITS has signed as many as 150 Memorandum of Understandings with lead institutions within and outside India to carry out research, industrial collaborations and student exchange activities. HITS has joined hands with ENAC France to start new Masters Programme on Aviation Safety Management in collaboration with Airbus and ENAC.

Towering as a portal of learning, HITS is aesthetically landscaped to house 8 Academic Blocks, 14 Centres of Excellence worth more than 200 crores for Research, state-of-the-art Workshops and Laboratories. The learning community comprises students from several foreign countries besides those from India. HITS has carved a niche by itself through establishing global collaborations with Institutes and Industries to promote Faculty & Student Exchange Programmes, Joint Research, Consultancy Projects, Conferences, and Guest Lectures.

HITS has been awarded many Patents and received many Funded Research Projects from leading organizations like Department of Science and Technology (DST), Defence Research and Development Organization (DRDO), Naval Research Board (NRB), and many others. With the noble vision of the Founder-Chairman, **Late Dr. K.C.G. Verghese, "To Make Every Man a Success and No Man a Failure"**, Hindustan Institute of Technology and Science chisels its learners with a competitive spirit to face the future.

# ACCREDITATIONS & RANKINGS

National Assessment and Accreditation Council (NAAC)  
A+ grade with a CGPA of 3.48



Accredits nine Engineering Programmes viz., Aeronautical, Aerospace, Computer Science, Information Technology, Electrical and Electronics, Electrical and Communication, Mechanical, Mechatronics, Automobile, and Civil.



National Institutional Ranking Framework

- #101-150 band University
- #101-150 band Innovation.



• #5 in India



Government of India  
Ministry of Human Resource Development

Ranked under Category – 2 by MHRD-UGC



• #2 -Tamil Nadu



SCIMAGO INSTITUTIONS RANKINGS

- Ranked # 769 in Global Category
- Ranked # 113 in All India Category



#501-600



- # 751-800 in Asia
- # 238<sup>th</sup> in Southern Asia



#601





- #1501+ - World
- #78th -India.

**Subject Rankings 2024**

- #801-1000 Computer Science
- #801-1000 Mathematics and statistics, Physics and Astronomy, Chemistry, Geology, Environmental, Earth and Marine Sciences
- 1001+ General engineering, Electrical and Electronic Engineering, Mechanical and Aerospace Engineering, Civil engineering, Chemical Engineering



- #101-200 in SDG 6 Clean Water and Sanitisation
- #401- 600 in SDG 7 Affordable and Clean Energy
- #201-300 in SDG 12 Responsible Consumption and Production
- #1000+ in SDG 17 Partnerships for the Goals



The Institution of Engineering and Technology

- Aeronautical, Mechanical, Aerospace, Automobile, Computer Science, Mechatronics, Information Technology, Electrical and Electronics, Electronics and Communications. One of the few Universities in India to be Internationally Accredited by IET, UK



- #22 - India
- #5 -South India
- #1 -Tamil Nadu
- #1 -Chennai.



- #8 -Top Engineering Colleges across India.
- #4 - Tamil Nadu
- #2 -Chennai



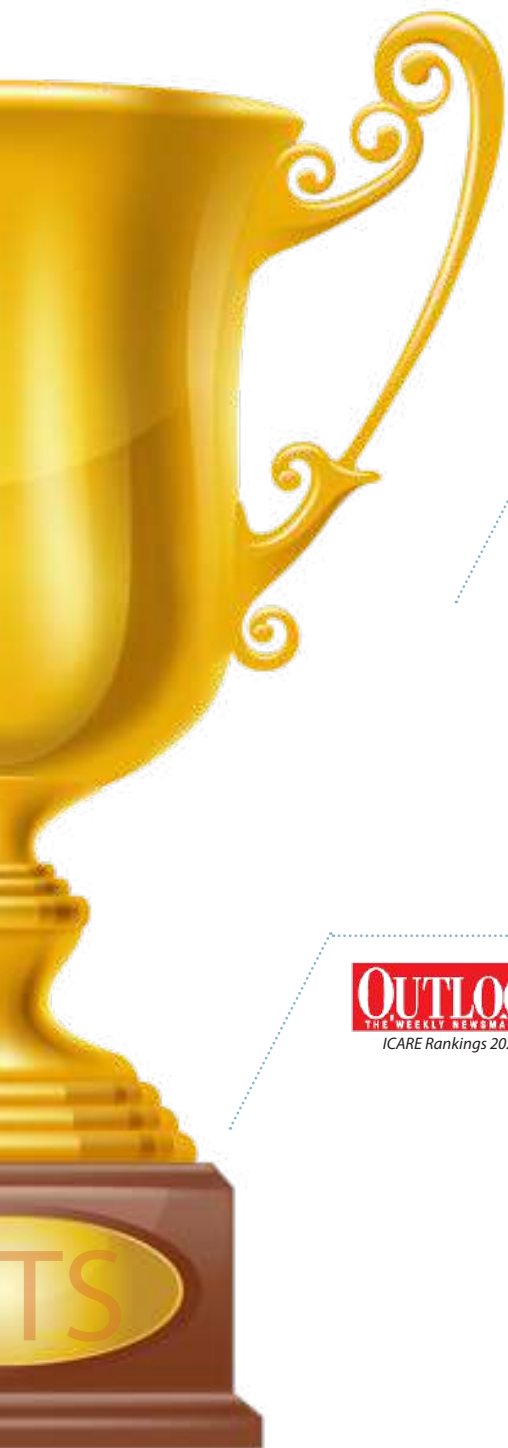
Rated **AAAA+** as one of the best Engineering Institutes in India



HITS Ranked #14 among top 100 Private Engineering Institutions in India



- #442<sup>nd</sup> position



# BOARD OF MANAGEMENT

Patrons



**Dr. Anand Jacob Verghese**  
Chancellor, HITS



**Dr. Ashok Verghese**  
Pro Chancellor, HITS

Chairperson



**Dr. S.N. Sridhara**  
Vice Chancellor, HITS



**Dr. R.W. Alexander Jesudasan**  
Pro Vice Chancellor, HITS



**Dr. S.P. Thyagarajan**  
Chancellor of Avinashilingam  
Institute for Home Science and  
Higher Education for Women,  
Coimbatore



**Dr. S.N. Hegde**  
Former Vice Chancellor  
University of Mysuru



**Dr. Rajeev Ahuja**  
Director, IIT Ropar



**Dr. C. Emmanuel**  
Director,  
Academic and Research,  
Gleneagles Global Health City,  
Chennai.

Members



**Dr. Aby Sam**  
Executive Director, HITS



**Dr. Annie Jacob**  
Director,  
KCG College of Technology



**Dr. Susan Verghese**  
Director, HCAS



**Mr. Enid Verghese Jacob**  
Deputy Director, HITS



**Dr. Sheeba Chander**  
Dean (SPADE), HITS



**Dr. R. Asokan**  
Dean (Aero), HITS



**Dr. Muthukumar Subramanian**  
Registrar, HITS

# CENTRE FOR RESEARCH & CONSULTANCY



*The Centre for Research and Consultancy has been established with the aim to promote research culture within the University to innovate in frontier areas of research, and share the learnt experience with industry, Government and Academia through collaborative projects and consultancy across disciplines of the University such that “No one” is left behind in striving new knowledge. The Centre has evolved policies for Research, Consultancy and Intellectual Property. The centre runs under the guidance of the research director and research Dean.*

## **Vision**

HITS shall transform itself into a knowledge generator while imparting quality technical education and become one of the best Science and Technological Research Institute.

## **Mission**

To promote research culture across the University and inculcate innovation and Technologies

The primary objectives of the Centre are to:

- ▶ Promote research.
- ▶ Develop and nurture international associations.
- ▶ Organize Colloquium and Training programmes for research scholars.
- ▶ Foster relationships with funding agencies & organizations.
- ▶ Facilitate preparation of project proposal and execution.
- ▶ Support Short-term Courses/Seminars/Workshops for effective dissemination of knowledge.
- ▶ Organize Lectures by Scientists from various R&D Organizations.
- ▶ Establish connectivity between faculty and scientists of various R&D Organizations and Industry.
- ▶ Improve Institute-Industry interaction and provide need based technology to existing industries.
- ▶ Identify and protect intellectual property.
- ▶ Conduct National and International Conferences.
- ▶ Ensure quality of research, its applications and relevance to society.

**50+**

Funded  
Projects

**80**

UG  
Programmes

**30**

Departments

**12000+**  
Students

**217**

Patents  
Filed

**40+**

Consultancy  
Projects

**600+**  
Faculty

**60**  
PG  
Programmes

Over  
**150**  
MoUs

**600+**  
Research  
Scholars

**10+**  
Schools

**14**  
Research  
Centres

# RESEARCH PROGRAMME

## Category (Full Time or Part Time)

Many candidates preferred to take their degree programmes on part time basis, although full time study is the most common choice. Candidates will be admitted to the Ph.D. programme under one of the following categories:

1. Regular full time scholars with or without institute fellowship or with project support (Full-time Internal)
2. Research scholars who are faculty members of our institute (Part-time Internal)
3. Research scholars who are employed elsewhere (Part-time External)

## Eligibility

Applications are accepted based on the previous academic performance, quality of the research proposal and the availability of suitable faculty to supervise the chosen topic. The minimum educational qualification for admission into the Ph.D. programme is Master's degree in an eligible discipline/ in relevant branch with a good academic record with a minimum 55% marks.

## Research Supervisor

A full time regular faculty of HITS can act as a Supervisor. The external Supervisors are not allowed. However, Co-Supervisor can be allowed in inter-disciplinary areas from other departments of HITS or from other related institutions with the approval of the supervisor recognition committee. Researchers working in public sector R&D organizations such as DAE, ISRO, DRDO can act as Co-Supervisor after due recognition.

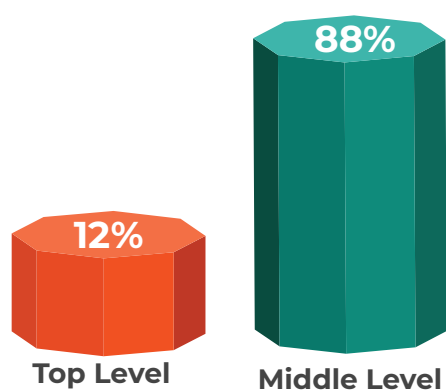
## Research Proposal

All applications must include a research proposal. This indicates the area of research and key issues to be examined. Understanding of the chosen area of research must be demonstrated and original research problem must be identified. The quality of the research proposal is extremely important and is a crucial part of the selection which include an in-person interview

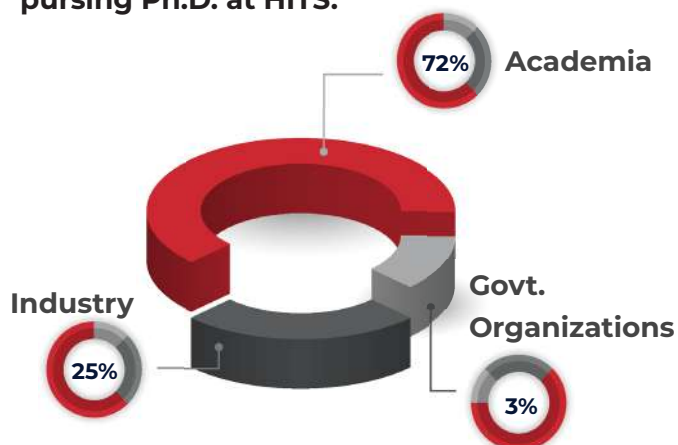
## Duration of Programme

The duration of the programme is counted from the date of registration. The minimum duration for the doctoral programme will be 3 years and the maximum duration will be 6 years.

**The Research Scholar pursuing Ph.D. here are working at top and middle level in various organizations.**



**The Research Scholars from Industry, Academia and Govt. Organization are pursuing Ph.D. at HITS.**





# RESEARCH AREAS

## 1. Aeronautical Engineering

- ▶ Aerodynamics
- ▶ Aeroelasticity and Structural Dynamics
- ▶ Avionics
- ▶ Propulsion
- ▶ Aircraft Materials and Additive Manufacturing
- ▶ UAV and Drones
- ▶ Flight Mechanics
- ▶ Aircraft and Helicopter Maintenance
- ▶ Computational Fluid Dynamics

## 2. Aerospace

- ▶ Space Mechanics
- ▶ Satellite Technology
- ▶ Satellite Design
- ▶ Guidance and Control of Aerospace Vehicles
- ▶ Computational Fluid Dynamics
- ▶ Space Propulsion
- ▶ Space Structures
- ▶ Smart Material

## 3. Automobile Engineering

- ▶ IC Engines & Future Fuels
- ▶ Autotronics & Electric Vehicles
- ▶ Vehicle Dynamics & Automotive Safety
- ▶ Computational Fluid Dynamics/  
Computer Aided Engineering
- ▶ Product Design & Development
- ▶ Motorsports

## 4. Biotechnology

- ▶ Bioadsorption Using Microalgal Species
- ▶ Environmental Biotechnology
- ▶ Protein Biochemistry
- ▶ Molecular Biology
- ▶ Drug Designing
- ▶ Protein modelling
- ▶ Cancer Biology
- ▶ Green Synthesis
- ▶ Herbal Scaffolds
- ▶ Wound healing

## 5. Chemical Engineering

- ▶ Municipal Wastewater Treatment
- ▶ Wastewater Treatment in Pharmaceutical industry
- ▶ Wastewater Treatment
- ▶ Separation Process
- ▶ Clean Energy
- ▶ Industrial Wastewater Treatment
- ▶ Advanced Oxidation Process
- ▶ Plastic waste Management
- ▶ Medicinal Chemistry

- ▶ Catalysis
- ▶ Alternate Fuels

## 6. Mechanical Engineering

- ▶ Additive Manufacturing
- ▶ Automation
- ▶ Industrial Safety
- ▶ Vibrations
- ▶ Engineering Design
- ▶ Engine Combustion
- ▶ Heat Transfer
- ▶ Composite Materials
- ▶ Alternate Fuels

## 7. Mechatronics Engineering

- ▶ Robotic Design and Controls
- ▶ Mobile Robots
- ▶ Intelligent Robotics & AI
- ▶ Multi Robot Systems
- ▶ Swarm Intelligence
- ▶ Soft, Assistive and Medical Robots
- ▶ Intelligent Automation
- ▶ Mechatronic System Design
- ▶ Motion Control
- ▶ Process Control Systems
- ▶ Embedded Systems
- ▶ Engineering Design and Manufacturing
- ▶ Instrumentation System Design
- ▶ IOT & IIOT System Design
- ▶ Heuristic and Meta Heuristic Optimization Approaches
- ▶ Virtual and Augmented Reality
- ▶ Robotic Process Automation
- ▶ Robotics Operating System
- ▶ Machine Vision
- ▶ Condition Monitoring
- ▶ Fault Diagnosis & Prognosis
- ▶ Predictive Analysis
- ▶ Renewable Energy
- ▶ Inspection System Design
- ▶ Machine learning

## 8. Civil Engineering

- ▶ Structural Engineering
- ▶ Construction Engineering and Management
- ▶ Environmental Engineering
- ▶ Transportation Engineering
- ▶ Wind Engineering & Computer Aided Structural Engineering
- ▶ Energy Production

## 9. Computer Applications

- ▶ Big Data Intelligence
- ▶ Block chain
- ▶ Cloud and Fog Computing
- ▶ Communication, Connectivity, and Networking
- ▶ Computer Vision and Pattern Recognition
- ▶ Game and Learning Algorithm
- ▶ Virtual Reality
- ▶ NLP and Human-to-Machine Interaction
- ▶ Ubiquitous Computing
- ▶ Bio-inspired Computing
- ▶ Mobile Computing
- ▶ Security, Privacy and Trust
- ▶ E-Learning
- ▶ Cognitive Computing
- ▶ Time Series Analysis
- ▶ Cyber Security
- ▶ Artificial Intelligence

## 10. Computer Science and Engineering

- ▶ Network & Security
- ▶ Big Data & Cloud Analytics
- ▶ Digital Image Processing & Pattern Recognition
- ▶ Cyber Security
- ▶ Artificial Intelligence

## 11. Information Technology

- ▶ Computer Networks
- ▶ Cloud Security
- ▶ Image Processing,
- ▶ Very Large Scale Integration (VLSI)
- ▶ Biometrics
- ▶ Data Analytics
- ▶ Semantic web
- ▶ Cloud Computing
- ▶ Software Engineering
- ▶ Web services and Service Oriented Architecture and Natural language processing
- ▶ Cyber Security
- ▶ Machine Learning

## 12. Electronics & Communication Engineering

- ▶ Communication Systems
- ▶ Wireless Networking
- ▶ VLSI & SOC
- ▶ Embedded Systems & IOT
- ▶ Signal & Image Processing
- ▶ Automation and Control
- ▶ Nano Devices and Technology
- ▶ Biomedical Engineering
- ▶ Instrumentation and Process Control
- ▶ Electronic System Design and Testiny
- ▶ Communication System and Sensors

## 13. Electrical & Electronics Engineering

- ▶ Power Systems
- ▶ Renewable Energy Systems
- ▶ Computer Applications to Smart Grid
- ▶ Electric Vehicles
- ▶ Control and Instrumentation

## 14. Fashion Design

- ▶ Textile
- ▶ Clothing & Apparel
- ▶ Sustainable Fashion

## 15. Food Technology

- ▶ Food Engineering
- ▶ Food Science
- ▶ Food Microbiology
- ▶ Food & Nutrition
- ▶ Dietetics
- ▶ Fermented Foods
- ▶ Food processing and Technology
- ▶ Food preservation and Packaging

## 16. Visual communication

- ▶ Media Studies
- ▶ Development Communication
- ▶ Environmental Communication
- ▶ Health Communication
- ▶ Social Media
- ▶ OTT and Cinema Industry
- ▶ Digital Film Making

## 17. Psychology

- ▶ Child Psychology
- ▶ Clinical Psychology
- ▶ Organisational Psychology
- ▶ Educational Psychology
- ▶ Media Psychology

## 18. Economics

- ▶ Health Economics
- ▶ Feminist Economics
- ▶ Economics of Innovation
- ▶ Ambedkar Economic Thought
- ▶ Behavioural Economics
- ▶ Agricultural Economics
- ▶ Migration
- ▶ Recent developments in Economics

## 19. Physical Education and Sports Science

- ▶ Sports Psychology
- ▶ Sports Physiology
- ▶ Kinesiology & Sports Biomechanics
- ▶ Test Measurement & Evaluation
- ▶ Kinanthropometry

- ▶ Sports Training
- ▶ Sports Management

## 20. Chemistry

- ▶ Inorganic Materials
- ▶ Targeted drug delivery
- ▶ Organic synthesis Complexes
- ▶ Computational Simulation on 2D Smart Materials
- ▶ Solar Cells
- ▶ Lithium-ion Batteries
- ▶ Luminescent Devices
- ▶ Photo Catalytic Applications
- ▶ Catalysis

## 21. English

- ▶ English Language Teaching
- ▶ Aviation English
- ▶ Business English
- ▶ Computer Assisted Language Learning
- ▶ American Literature
- ▶ Past Colonial Literature
- ▶ British Literature
- ▶ Linguistics
- ▶ Canadian Literature
- ▶ Christian Literature

## 22. Mathematics

- ▶ Differential Equations
- ▶ Graph Theory
- ▶ Fuzzy Optimization and Fuzzy Theory
- ▶ Machine Learning, Data Science, and Functional Equations
- ▶ Numerical Analysis
- ▶ Stochastic Optimization
- ▶ Fluid Dynamics
- ▶ Generalized Topology
- ▶ Algebra
- ▶ Fuzzy Graph Theory
- ▶ Operation Research

## 23. Physics

- ▶ Materials Science
- ▶ Conducting Polymers
- ▶ Nanocomposites
- ▶ Magnetic Materials
- ▶ Thin Films

## 24. School of Planning, Architecture & Design Excellence

- ▶ Sustainable Design
- ▶ Smart Cities
- ▶ Sustainable Urban Planning
- ▶ Sustainable Built Environment

- ▶ Vernacular Architecture
- ▶ contemporary Design
- ▶ Urban Heat Island
- ▶ Transit Oriented Development
- ▶ Land and Real Estate Management
- ▶ Interior Design and Aesthetics
- ▶ Psychology and Interior
- ▶ Lighting and Interior.

## 25. School of Management

- ▶ Aviation
- ▶ Entrepreneurship
- ▶ Finance
- ▶ Hospital Management
- ▶ Marketing
- ▶ Operations
- ▶ Hospitality Management
- ▶ Human Resource
- ▶ Logistics
- ▶ Strategy
- ▶ Quality Management
- ▶ Media

## 26. School of Allied Health Sciences

- ▶ Pharmaceutical Sciences
- ▶ Pharmacology
- ▶ Drug delivery systems
- ▶ Toxicology
- ▶ Biomechanics
- ▶ Dry needling
- ▶ Medical image segmentation
- ▶ Artificial Intelligence in Clinical diagnosis.
- ▶ Virtual Reality in Rehabilitation
- ▶ Physiotherapy

## 27. School of Law

- ▶ Labour Law
- ▶ Judicial Activism
- ▶ Corporate Law
- ▶ Environment Law
- ▶ Constitution Law
- ▶ Cyber Law
- ▶ Family Law
- ▶ Maritime Law
- ▶ Criminal Law

## 28. Interdisciplinary

- ▶ Catalysis
- ▶ Cyber Security
- ▶ Artificial Intelligence
- ▶ Alternate Fuels
- ▶ Machine Learning

# ADMISSION PROCESS

## How to apply

### 1 >> Identify your Research Area

Identifying the research area and the corresponding department is the first step in applying for the doctoral programme.

### 2 >> Write your Research Proposal

This is a crucial step on your road to becoming a research scholar. Your proposal outlines your research objectives.

### 3 >> Apply for the Doctoral programme

You need to apply for the programme online from our website

<https://apply.hindustanuniv.ac.in/ph-d-application-form>



### 4 >> Test and Interview

After the scrutiny of applications, written test and in-person interview by our subject experts will be conducted.

## 5 >> Pay your fees

The selected candidates will receive admission confirmation mail from CRC. The admission process will end with the payment of the first year tuition fee.

## 6 >> Start your Research

Success! You have made it through all the steps. Start your research at HITS.

## 7 >> Required Materials

**Applicants should ensure that the following supporting materials are included with their online application**

1. UG & PG Degree Certificate
2. UG & PG Mark Sheet (Consolidated)
3. One-page research proposal (500 Words)

## 8 >> International Students

HITS welcomes applications for admission from students all over the world. The procedure is the same as above. For more details, please check the link below.

[https://hindustanuniv.ac.in/international\\_students\\_admission.php](https://hindustanuniv.ac.in/international_students_admission.php)



# RESEARCH FELLOWSHIP & AWARDS

## FELLOWSHIP

### Hindustan Teaching Research Fellowship (HTRF)

To promote research, HITS has instituted the Hindustan Teaching Research Fellowship (HTRF) for eligible candidates. The following fellowships are available for Full-time Research Scholars registered for Ph.D.

Stream	Category	Eligibility	Fellowship Proposed (Rs.)
Engineering/ Technology/Law	1a	GATE qualified (Engg & Tech.)	Rs. 30,000
	1b	75% and above marks obtained in UG & PG and Research in thrust area	Rs. 25,000
	1c	75% and above marks obtained in UG & PG	Rs. 20,000
Science and Mathematics	2a	Net qualified	Rs. 30,000
	2b	70% and above marks obtained in UG & PG	Rs. 18,000
Liberal Arts & Applied Science and Management	3a	NET qualification	Rs. 30,000
	3b	65% and above marks obtained in UG & PG	Rs. 15,000
Any stream	4	Less than 65% marks obtained in UG & PG	Rs. 13,000

Short listed candidates shall make a presentation before a panel of experts. Selection will be based on the following criteria.

**Subject Knowledge | Capability to Teach | Presentation Skills | Communication Skills | Analytical Skills**

## AWARDS

### Founder's Award for Best Research Scholar

Founder's Best Research Scholar Award carries a cash prize and a certificate. The awardees are eligible to be considered for financial assistance from HITS to attend International/ National Conferences.

#### Eligibility:

1. The scholar would be eligible after one year of registration.
2. Scholar should be GATE/NET qualified/ should have secured more than 80% in UG & PG Engineering Courses/ 75% marks in UG & PG courses in Science, Management or Humanities.
3. Supervisor's Recommendation for award is mandatory.
4. Recommendation from relevant Industry Expert is required.

# INCENTIVES & SPONSORSHIPS

## Incentives for publishing in refereed National/ International Journals

International Journal (Peer reviewed, Scopus / WoS Indexed, Impact Factor) Author	Q <sub>1</sub>	Rs. 10,000
	Q <sub>2</sub>	Rs. 7,500
	Q <sub>3</sub>	Rs. 5,000
	Q <sub>4</sub>	Rs. 2,500
International Journal (Peer reviewed, Scopus / WoS Indexed, Impact factor) Co-Author (or) National Journal Author	Q <sub>1</sub>	Rs. 5,000
	Q <sub>2</sub>	Rs. 3,750
	Q <sub>3</sub>	Rs. 2,500
	Q <sub>4</sub>	Rs. 1,250
Conference Publication (International) (Peer reviewed, Scopus / WoS Indexed, Impact factor)		Rs. 2,000
Conference Publication (National) (Peer reviewed, Scopus / WoS Indexed, Impact factor)		Rs. 1,750

## The incentive for book publications are:

<b>Reference Books (Engineering, Science &amp; Humanities)</b>		<b>Author</b>	<b>Co-Author</b>
Reference Book publication (International)	ISBN No.	Rs. 20,000	Rs. 15,000
Reference Book publication (National)	ISBN No.	Rs. 15,000	Rs. 12,000
Reference Book Chapter publication (International)	ISBN No.	Rs. 10,000	Rs. 8,000
Reference Book Chapter publication (National)	ISBN No.	Rs. 7,500	Rs. 6,000
<b>General Books (Engineering, Science &amp; Humanities)</b>		<b>Author</b>	<b>Co-Author</b>
General Book publication (International)	ISBN No.	Rs. 15,000	Rs. 12,000
General Book publication (National)	ISBN No.	Rs. 7,500	Rs. 6,500
General Book Chapter publication (International)	ISBN No.	Rs. 6,000	Rs. 4,000
General Book Chapter publication (National)	ISBN No.	Rs. 5,000	Rs. 3,000

### The Incentives for International Innovation Patent filing

The Faculty members will be asked to submit applications. Review and ranking of the applications will be done by the Selection Committee. Four distinct plans would be used to sponsor the authorized budget of Rs. 10 lakhs.

Rank	Sponsorship	Total Amount in Rs.
1-10	100%	4,18,000
11-20	75%	3,13,000
21-30	25%	2,09,000
31-42	Rs. 5,000/- one-time payment	60,000

### The incentives for obtaining funded Projects

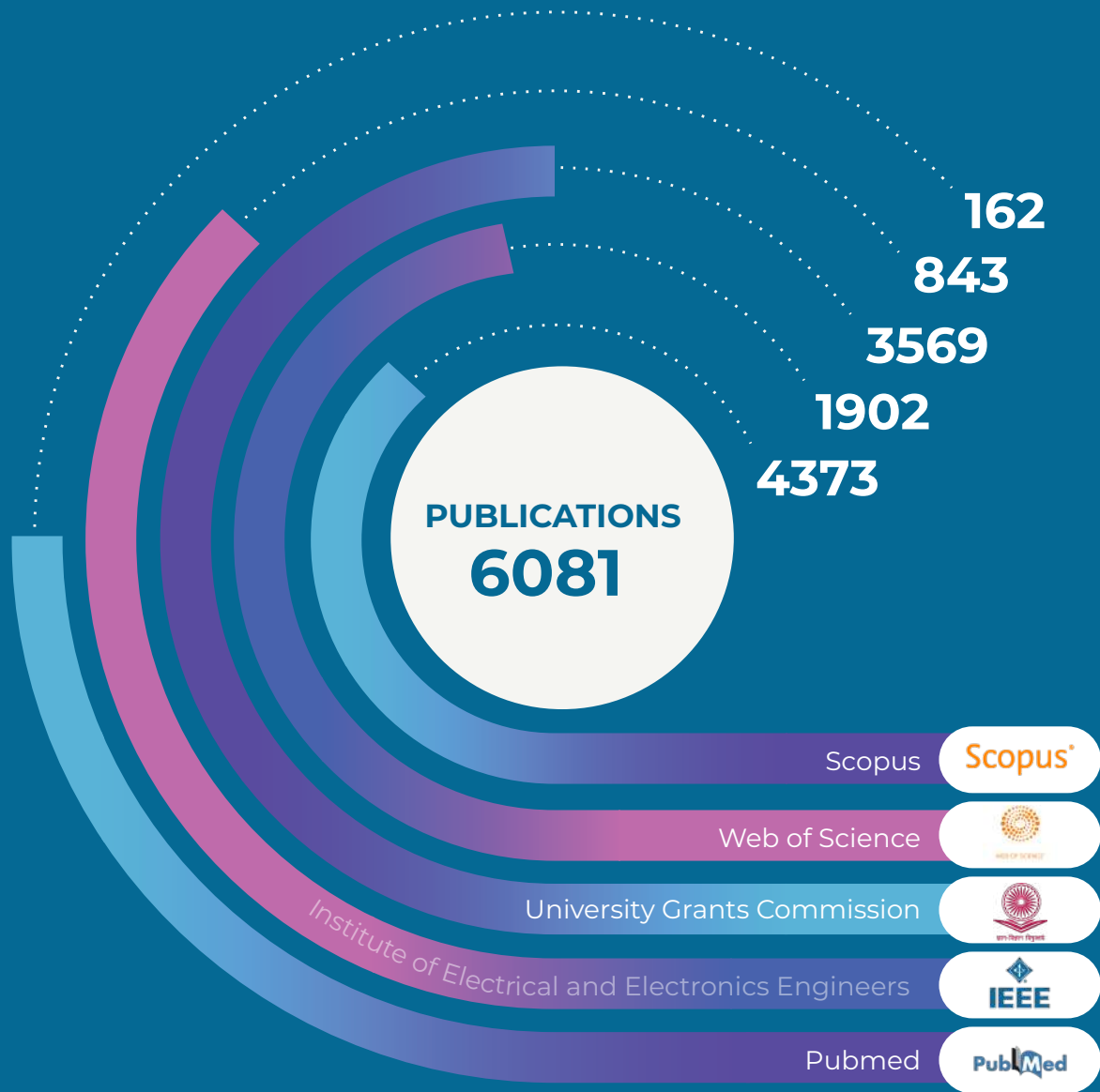
Overall Research Fund	Percentage (as incentive)	Maximum Incentive in Rs.
Below 1 Crore	2.5%	2,50,000
1-2 Crore	3%	6,00,000
Above 2 Crore	3.5%	

### The sponsorship for participating in various events

S.No	Purpose	Benefits/ Incentive / Rewards
1	Paper presentation in National/ International Conferences - both in India and abroad	Partial/full registration fees of the Conference and financial support for the travel and stay subject to clearance by the Review Committee
2	Participation in National/ International Conferences/ Faculty Development Programs/ Workshops and other events	Partial/full financial support subject to clearance by the Review Committee



# PUBLICATIONS



SCOPUS  
CITATIONS  
**18301**

WOS  
CITATIONS  
**29324**

HIGHEST  
IF  
22.10

HIGHEST  
SNIP  
11.486

# 14 RESEARCH CENTRES OF EXCELLENCE



1. Clean Energy and Nano Convergence (CENCON)
2. Centre for Automation and Robotics (ANRO)
3. Centre for Sensors and Process control (CENSE)
4. Centre for Sustainable Technologies (CST)
5. Centre for Automotive Electronics (CAE)
6. Centre for Networking and Cyber Defense (CNCD)
7. Machine Intelligence and Data Analysis Research Centre (MIDARC)
8. Centre of Excellence in Satellite Technology (CEST)
9. Centre for Autonomous Systems (CAS)
10. Simulation and Engineering Design (SIMENDES)
11. Centre of Excellence in Underwater Robotics and Communication (UROC)
12. Structural Impact and Crash Simulation (SIMCRASH)
13. Higher Education Leadership Management (HELM)
14. Centre of Excellence for Hardware Innovative Test Technology Systems (E-HITS)

# 01

CENTRE FOR CLEAN ENERGY  
& NANO CONVERGENCE  
(CENCON)

ESTABLISHED

06 JANUARY 2011

### **Vision:**

To make CENCON as a regional research hub to carry out basic & applied research in the area of clean energy and nanotechnology.

### **Mission:**

To strengthen the infrastructure, research activities and develop network with worldwide institutions, national labs and industries working in the area of clean energy nanotechnology.

### **Research Partners**





The **Centre for Clean Energy and Nano Convergence** (CENCON) was established in collaboration with Quantum–Functional Semiconductor Research Centre (QSRC) of Dongguk University with an objective to promote basic and applied research in Nanotechnology. The centre was inaugurated by His Excellency, Dr. A. P. J. Abdul Kalam, Former President of India on 6<sup>th</sup> January 2011. The centre aims to work towards clean energy solutions incorporating the quintessence. The Centre offers M.Sc. Nano Science & Technology course.

### Research Areas

Computational simulation on 2D smart materials, Solar cells, Lithium-ion Batteries, Luminescent devices, Sensors and Photo Catalytic Applications R&D Projects

### Research Facilities

Scanning Electron Microscopy (SEM) with Energy Dispersive X-ray spectroscopy (EDS), High Performance Computing facility (HPC), Battery Tester, Electrochemical workstation, Hall Effect Measurements, UV – Visible Spectrophotometer, UV – VIS – NIR Spectrofluorometer, Thermal Vacuum Coating unit, Chemical Vapor Deposition, Freeze Drier, Hydraulic Press, Nabertherm Furnace and Spin coater.

### Research Outcomes

#### Publications

CENCON Team has published more than 95 research articles in high impact journals such as International Journal of Hydrogen Energy, Materials Today Chemistry, ACS Applied Nano Materials, Applied Surface Science, Royal Society of Chemistry Advances.

#### Funded Projects

- ▶ Enhancement of Photovoltaic efficiency by down-conversion phosphors for underwater panels towards Naval applications –Naval Research Board (NRB), DRDO
- ▶ Development of a Photo-electrochemical Cell (PEC) using Si based (In)GaN Nanowires for
- ▶ Hydrogen production by Splitting of Water under Visible Light – National Post-Doctoral Fellowship (NPDF), Science and Engineering Research Board (SERB)
- ▶ Edge Saturated Si<sub>2</sub>BN Nano-ribbon as High –Capacity Anode Materials for Next Generation Mg-ion Batteries. SERB –TARE
- ▶ Sn integrated 3D, porous carbon based scaffolds as high capacity anode for Sodium-ion batteries. Science and Engineering Research Board – Teachers Associateship for Research Excellence (SERB –TARE)
- ▶ Carbon-Based Materials with High Antibacterial Activity for Face Mask Application to combat COVID 19. SERB –TARE

#### Patent

Highly Efficient Easy-on-pocket, One-use Biodegradable, Antimicrobial-Face-Mask to Battle against COVID-19 - Australian patent has been submitted

CONTACT

**Dr. Puspamitra Panigrahi**

**Head, CENCON**

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# 02

CENTRE FOR AUTOMATION  
AND ROBOTICS  
(ANRO)

ESTABLISHED

20 OCTOBER 2014

## Vision:

To emphasize robotics and automation related research, product development, teaching, training, and consultancy with a goal to innovate and disseminate new knowledge to meet the needs of industries and society

## Mission:

- ▶ Reach National prominence through high quality research practice and services and develop as renowned research centre in India
- ▶ Become a sustainable and productive centre of Excellence through indigenous research, advanced training, and academic practices
- ▶ Promote interdisciplinary graduate and post graduate programs through a distinctive industrial and research collaborations
- ▶ Develop relationships with potential, national and international collaborators to promote joint projects and programmes

## Research Partners



London  
South Bank  
University



UNIVERSITY OF LEEDS



Centre for Automation and Robotics (ANRO) was established on 20<sup>th</sup> October 2014 to promote educational and research activities in the area of robotics, automation, and computer vision. This Centre bridges the gap between industries and Department of Mechatronics Engineering at HITS with a distinctive capability to harness the intellectual energy of academia to impact Indian industries.

### Research Areas

To innovate and disseminate new knowledge to meet the needs of industries and society

- ▶ Robotics, Intelligent Automation, Condition Monitoring, Artificial Intelligence, Virtual Reality & Augmented Reality

### Research Facilities

ANRO laboratories are designed for collaborative research, providing future-proof spaces for research and education.

Facilities include: Yaskawa Industrial Robots, Gantry Robot, Collaborative Robot, Mobile Robot Platforms, Virtual/ Augmented Reality, Flexible Manufacturing System, Advanced Pneumatic Trainers, CNC Machining Centre, Laser Cutting Machines, Motion Sensors, 3D Printers, IoT development platforms

### Research Outcomes

#### Funded Projects

- ▶ Autonomous Heterogeneous Robotic Swarm Simulator, in collaboration with Leicester University, Funded by Royal Academy of Engineering, UK.
- ▶ Trainer for Tactical Warfare, funded by Combat Vehicles Research & Development Establishment, DRDO, Govt. of India
- ▶ Adaptive Control of Robotic Fettling, Funded by SERB, DST.
- ▶ Wall climbing robot for the internal non-destructive testing (NDT), in collaboration with London South Bank University, Funded by Royal Academy of Engineering, UK.
- ▶ Suzhali – The Powered Air Purifying Respirator, Funded by Indian Medical Association.
- ▶ Low-cost patient Assistive Robot, in collaboration with University of Leeds, UK, Funded by Royal Academy of Engineering, UK
- ▶ Intelligent System for Adaptive Enhancement of Underwater, Funded by Naval Research Board (NRB), DRDO
- ▶ Modelling and Simulation of an Electromagnetic Retarder, Funded by Rambal Limited
- ▶ Sevili – The Assistive Robot, Funded by Renault Nissan Technology Business Center

#### Patent

- ▶ Sevili – Assistive Robot
- ▶ PAPR – Suzhali
- ▶ Quadruped Robot

CONTACT

**Dr. S. Janaki Raman**

**Head, ANRO**

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# 03

CENTRE FOR SENSORS  
AND PROCESS CONTROL  
(CENSE)

ESTABLISHED

08 OCTOBER 2016

## Vision:

To create a Centre of Excellence in sensors, sensor systems, Robotics applications, Measurement, Instrumentation and Process Control Systems

## Mission:

- ▶ To establish state of the art multidisciplinary research facility.
- ▶ To promote meaningful collaborations with National / International bodies and Universities.
- ▶ To be proactive in providing practical solutions to industrial problems.
- ▶ To provide practical, technical landscape to accelerate the transfer of technology from the research base to industry.

## Research Partners



**POLITECNICO**  
MILANO 1863

**ARM** University  
Worldwide Education Program



Government of India

**AERB**

Atomic Energy Regulatory Board







The Centre for Sensors and Process Control (CENSE) was inaugurated by Dr. Sekhar Basu, Chairman, Atomic Energy Commission and Secretary, Department of Atomic Energy, Government of India in the presence of Dr. Amitabh Mattoo, Former Vice Chancellor, University of Jammu on 8<sup>th</sup> October 2016. The Centre aims to work towards indigenous sensor development solutions incorporating the latest technology.

## Research Areas

Acoustic Signal processing, Robotics and Industrial Automation, Remote handling applications, Remote inspection applications, Smart Sensor Design, Process control applications, Multidisciplinary handling application, Environment monitoring, Energy management, Medical Instrumentation, Nano Electronics.

## Research Facilities

B&K make 2270 model Hand held Sound Analyzer, ARM development software keil tools, COMSOL AC DC Module, NI My-Rio with Labview, Embedded Development Systems: CYPRESS FM4-176L Arm Cortex-M4 MCU, LPC 1115 LPC Xpresso Boards, LPC L2 Link Boards.

## Research Outcomes

### Publications

CENSE Team has published more than 40 research articles in high impact journals such as IEEE Sensors, International Journal of Alzheimer's Disease, Advanced Materials Research, Wireless Communications and Mobile Computing, Journal of Electronic Science and Technology, Journal of Building Engineering.

### Funded Projects

- ▶ Development of an on-line measurement system for hydrogen concentration in steam environment-AERB, DAE
- ▶ Wall Climbing Robot with reduced sound levels using Active Noise Control – ERIPR DRDO

### Consultancy Projects

- ▶ Development of See Through Wall Passive Eddy Current Sensor for Blade Detection - GTRE DRDO
- ▶ Design, Development and characterization of electrostatic sensor with digital electronic system for Debris Monitoring in Gas turbines - GTRE DRDO
- ▶ Development of Position control system - GTRE DRDO
- ▶ Development of automatic Tea leaf cutter for inclined terrain harvesting – Poabs Tea Private Ltd.

### Patents

- ▶ Multifunctional Bed for Quadriplegia Patients, Indian Patent (Granted)
- ▶ A patient essentials transport system - Australian Patent (Granted)

CONTACT

**Dr. G. Muthukumaran**

**Head, CENSE**

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# 04

CENTRE FOR SUSTAINABLE  
TECHNOLOGIES  
(CST)

ESTABLISHED

20 AUGUST 2014

## Vision

To find solutions for problems related to Development of Infrastructure and Environment towards sustainability.

## Mission

- ▶ To promote interdisciplinary activities and initiatives that lead to sustainability associated with Infrastructure and Environment.
- ▶ To develop and showcase cost effective solutions in the areas of green building materials, health monitoring of structural systems, water, air, solid waste management, renewable energy and other issues related to environmental resources using the state of art technologies.
- ▶ To develop technologies for cleaner production and help the industries for adoption.

## Research Partners

 **Universidad  
de La Laguna**



**EVERSENDI**  
Towering - Powering - Energising - Innovating



The Centre for Sustainable Technologies was established during the year 2014. Its objectives are to promote interdisciplinary activities that lead to sustainability associated with Construction and Environment, to develop cost effective solutions in the areas of green building materials, health monitoring of structural systems, water, air, solid waste management, renewable energy related to environmental resources and also to develop technologies for cleaner production

### **Research Areas**

Green building materials, Health monitoring of structural systems, CO<sub>2</sub> storage in Concrete structures, Water, Air, Solid waste management, Recovery of Hydrogen from wastewater containing Sulphide, Steel Timber Composite Structures, Cold Formed steel structures and retrofitting of structures

### **Research Facilities**

Vertical loading frame 40T capacity, Column testing frame 100 T capacity, Data acquisition system, Reversed lateral loading frame 20 T capacity, Computerized UTM, Carbonation Chamber, UV-Vis Spectrophotometer, Photocatalytic reactor for Hydrogen Recovery, Tubular Furnace, Deep freezer, Atomic Absorption Spectroscopy and Flame Photometer

### **Research Outcomes**

#### **Publications**

CST Team has published more than 35 research articles in high impact journals such as Environment, Development and Sustainability, International Journal of Hydrogen Energy, Chemosphere, Journal of Water Process Engineering, Nanomaterials, Construction and building materials, Asian Journal of Civil Engineering and Journal of Environmental Management

#### **Funded Projects**

- ▶ Recovery of Hydrogen from Sulphide Waste Streams by SERB, DST
- ▶ Development and Characterization of High-Volume Fly Ash Concrete for structural applications by Department of Atomic Energy (BRNS scheme)

#### **Patents**

- ▶ Cold-Formed Steel Beam with Encased Braced Web for Earthquake Resistant Constructions
- ▶ Quasi-Static Cyclic Load Performance Testing Method of Encased Concrete-Filled Steel Tubular with Steel Loops Joint
- ▶ Gas-Phase Recovery of Hydrogen from Hydrogen Sulphide Using Photocatalysis

**CONTACT**

**Dr. J. Samuel**

**Head, Sustainable Technologies**

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# 05

CENTRE FOR AUTOMOTIVE  
ELECTRONICS  
(CAE)

ESTABLISHED

03 OCTOBER 2015

## Vision

To be the Centre of knowledge for research, development and Professional service in Automotive Electronics and Partnered with industry to deliver leading edge technologies in a vibrant research education environment.

## Mission

Committed to create and disseminate knowledge through a range of high-quality academic program in a Student-Centered learning environment emphasizing intellectual achievement and employability in the field of Automotive Electronics.

## Research Partners



HOCHSCHULE TRIER  
Trier University of Applied Sciences

DAAD

Deutscher Akademischer Austauschdienst  
German Academic Exchange Service



AUTOTRONICS  
BY VOLKSWAGEN GROUP ACADEMY



BOSCH

ŠKODA | VOLKSWAGEN  
SKODA AUTO Volkswagen India Private Limited



The Centre for Automotive Electronics is established under Department of Automobile Engineering with the objective of augmentation of research in current trends in automotive electronics to inculcate a research culture among the students and faculty of the HITS. The Centre for Automotive Electronics focuses to offer industry-oriented training for students and Professionals through Volkswagen's Advanced Diploma in Autotronics Program in collaboration with Skoda Auto Volkswagen India Pvt. Ltd.

### Objectives

- ▶ To conduct advanced technical programs and research programs to enrich the knowledge in the field of Automotive Electronics.
- ▶ To produce professional researcher capable of continuously providing consultancy service to the automotive industry.
- ▶ To Nurture human resources having expertise and advanced knowledge in automotive technology.

### Research Areas

Advanced Driver Assistance System (ADAS), Vehicle Safety, Vehicle Diagnosis, Digital Mobility, Sustainable Transportation

### Research Facilities

Autotronics Laboratory, HITS – Bosch Joint Training Centre, Automotive Electrical and Electronics Laboratory

### Research Outcomes

#### Consultancy Project

Centre for Automotive Electronics is working on consultancy projects with Krux Studio, Mumbai on Development of Embedded Tech Accessories for Car.

#### Patents

- ▶ System and Method for Automatic Helmet Detection to Enhance the Rider Safety Using Deep Learning
- ▶ A Child Occupant Protection and Safety Assisting System for Vehicle.
- ▶ An IOT based Intelligent Driver Assistance System

CONTACT

**Dr. Shanmuganathan T.**

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# 06

CENTRE FOR NETWORKING  
AND CYBER DEFENSE  
(CNCD)

ESTABLISHED

24 APRIL 2013

## Vision

To be a globally renowned academic department for quality education and research in the field of Information Technology with ethical values and social commitment.

## Mission

- ▶ To impart comprehensive technical education to produce highly competent IT professionals and entrepreneurs.
- ▶ To provide an academic environment for state-of-the-art research with ethical standards.
- ▶ To conduct knowledge transfer programs to enhance the technical knowledge in the field of Information Technology

Research Partners





## Centre for Networking & Cyber Defense

Centre for Networking and Cyber Defense (CNCD) was established in the year April 2013 with the aim to carry out research and impart knowledge in Networking and Cyber security. The Centre has been formed with domain expertise from the Hindustan Institute of Technology and Science, HTC, IBM and D-Link. The Centre is also involved in community outreach programmes to create awareness of cyber security. Hindustan Institute of Technology and Science is one of the top universities in India to offer courses in Under Graduate, Post Graduate, and Professional diploma in Cyber Security, Ethical Hacking and Cyber Forensics.

### Research Areas

- ▶ Threat Intelligence
- ▶ Deception Technology
- ▶ Cloud Security
- ▶ Network Security
- ▶ Web Security
- ▶ Cyber Security.

### Research Facilities

- ▶ Kerckhoffs Lab was installed in collaboration with Check Point Software Technologies Ltd - Secure Academic Alliance (Project Lab)

### Research Outcomes

#### Patents

Securing Critical Digital Assets of Chemical Industries using Secure Development Operational Environment (SDOE) Framework

#### Travel Grant Obtained

Fund obtained (1200 GBP) after at World Technology Universities Network (WTUN), United Kingdom (UK) for Exchanges and Joint Research Meetings at University of Bradford, the UK from 3<sup>rd</sup> to 8<sup>th</sup> April 2019.

CONTACT

**Dr. S. Gopalakrishnan**

**Head, CNCD**

**Email:** [it@hindustanuniv.ac.in](mailto:it@hindustanuniv.ac.in)



# 07

MACHINE INTELLIGENCE  
AND DATA ANALYSIS  
RESEARCH CENTRE  
(MIDARC)

ESTABLISHED

05 AUGUST 2019

## Vision

The Vision of the Machine Intelligence and Data Analytics Research Centre MIDARC is to become a world class, self-sustaining research centre that provides an integral platform for synergizing research potential in realizing the best-of-breed, state-of-art business solutions through the deployment of cutting-edge technologies and applications.

## Mission

The Mission of the centre is to maximize the use of resources and facilities in order to emerge as a full-fledged research centre with a diverse portfolio of research projects funded by top nodal funding organizations.

## Research Partners







Machine Intelligence and Data Analysis Research Centre (MIDARC) was founded in collaboration with two international partners Stevens Institute of Technology, USA as Academic partner and Machine Intelligence Research (MIR) Labs, USA a global non-profit academic consortium and IBM as an industry partner. The aim of establishing this centre is to provide a vital and perfect platform for the research scholars to coordinate and focus their diverse domain specific research acumen in producing a cutting-edge technical solution and applications to a persisting business challenge. The incubation of this Centre MIDARC happens to fall in line with time when the contemporary digital world is governed by Computational Intelligence, Big Data Analytics and Cognitive Computing.

### Research Areas

Artificial Intelligence, Machine Learning, Deep Learning, Big data Analytics, Natural Language Processing and Cognitive Computing

### Research Facilities

- ▶ AI GPU Deep Learning Lab with IBM Minsky Server with 2 NVidia P100 GPU with NVlink Technology
- ▶ Mark Zuckerberg New Data Science Lab with 60 X- i7/16 GB RAM/ 1TB HDD systems.
- ▶ MATLAB with Deep Learning Toolbox, Statistics and Machine Learning Toolbox, Text Analytics Toolbox, Image Processing Toolbox, Medical Imaging Toolbox, Computer Vision Toolbox, Reinforcement Learning Toolbox, Predictive Maintenance Toolbox

### Societal Benefit

1. The centre intends to produce programmes that will solve enduring difficulties in the agricultural industry in a delicate manner, thereby weeding out undesired problems and enhancing productivity and returns.
2. There are also plans to deliberate and develop indigenous projects to mitigate the effect of global warming.
3. Other topics in which the Centre intends to intervene and provide remedial methods include Pollution Monitoring, Health Care and Waste Management and also from leather industry.

### Major Events

The Centre organized a National Conference on Computational Intelligence and Data Analytics on 30-31 March 2023 (NICIDA 2023)

### Research Outcomes

#### Funded Project

Development of Drug Response Prediction Model using Ensemble Learning for clinical Application

Development of a web app for Agriculture from Sustainable Global Peace Trust

CONTACT

**Dr Thangakumar J**

**Head, Machine Intelligence & Data Security**

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A satellite is shown in orbit against the backdrop of Earth and a starry space. The satellite has a large solar panel array extending from its main body. A yellow circular graphic is overlaid on the right side of the image, containing the number '08' and the text 'CENTRE OF EXCELLENCE IN SATELLITE TECHNOLOGY (CEST)'. Below this graphic is a blue and yellow banner with the text 'ESTABLISHED 30 SEPTEMBER 2022'. At the bottom of the page, there is a white rounded rectangle containing the 'Vision' and 'Mission' sections.

# 08

CENTRE OF EXCELLENCE IN  
SATELLITE TECHNOLOGY  
(CEST)

ESTABLISHED 30 SEPTEMBER 2022

## Vision

- ▶ To establish Center of Excellence in Satellite technology (CEST) as a Global technological centre in the field of satellite development and space applications, fostering a nurturing environment that facilitates and expedites the advancement of space technology for the betterment of society.

## Mission

- ▶ To spearhead innovation through international collaboration and take the lead in integrating and delivering multidisciplinary research and development solutions in the realm of satellite and space technology.
- ▶ We aim to produce a skilled workforce in the rapidly evolving field of satellite and space technology through international collaboration.
- ▶ To establish the center as a unique knowledge base and training facility within the private sector, providing advanced training in the fields of satellite and space technology



The Centre of Excellence in Satellite Technology is the advanced research centre created with an aim to foster and accelerate the growth of space based technological applications for the benefit of society and to impart advanced training & research in the field of satellite technology and development. The Centre of Excellence in Satellite Technology was

inaugurated by Dr. S Somanath, Chairman, Indian Space Research Organisation (ISRO) on 30<sup>th</sup> September 2022. This centre is established under the able guidance of Dr. A Sivathanu Pillai, Founder CEO & MD BrahMos Aerospace and Professor Emeritus (Research), HITS.

### Research Areas

- ▶ Design and Development of Nano/Pico/Femto Sats Structural & Thermal Analysis
- ▶ Development and Testing of CANSATS Satellite/Constellation Mission Design Analysis
- ▶ Precision Agriculture using Satellites
- ▶ Astronomy & Space Habitability
- ▶ Antenna Design Satellite Tracking & Link Budget Study

### Research Facilities

- ▶ Low Earth Orbit (LEO) Satellite Tracking Ground Station
- ▶ Long Range (LoRa) based IoT platform
- ▶ Facility to track satellites in LEO with Upper UHF frequency

### Centre Activities

#### 1. Weather Satellite Tracking:

CEST gives students the ability to actively monitor and track National Oceanic and Atmospheric Administration (NOAA) Weather Satellites of the USA. By decoding and processing the data received from NOAA, the Centre creates an unparalleled and interactive experience in Space Technology and Weather Monitoring.

#### 2. Student Trainings:

CEST offers exciting projects to students in Nano/Pico/Femto Satellite development, Satellite tracking and Ground Station Operations, involving design & development of the satellite, receiving data from a satellite, decoding and processing the data for analysis.

### Research Outcome

#### KCG VERGHESESAT Project

KCG VERGHESESAT is a 1U satellite developed by the students of the Hindustan Group of Institutions, under the 75 Student Satellite Mission to commemorate the 75<sup>th</sup> year of Independent India. The KCG VERGHESESAT is equipped with LoRa payload for Intersatellite Communication which can be used to communicate with the fishermen in deep seas using the constellation of satellites with an aim of aiding the society during the onset of any natural disasters like cyclones. KCG VERGHESESAT is also equipped with sensors to receive data from the water buoys to monitor the water levels in ponds and lakes during torrential rains.

### Ongoing Projects

1. Design and Development of a 1U satellite KCG VERGHESESAT
2. Intersatellite Communication with LoRa Module for CubeSats
3. Satellite Orbit Debris Management using CubeSats
4. On-Orbit Satellite Refuelling by Magnetic Docking Mechanism

CONTACT

**Dr. P. Vasanthakumar**

**Head, Centre of Excellence in Satellite Technology**

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# 09

CENTRE FOR  
AUTONOMOUS SYSTEMS  
(CAS)

ESTABLISHED

03 OCTOBER 2015



## Vision

To create a unique environment to facilitate and accelerate the design, development and training of the Unmanned Air Systems (UAS) at HITS.

## Mission

To head innovations through global participation and to lead, integrate, and deliver multidisciplinary research and develop solutions in Unmanned Aerial Vehicle (UAV).

## Research Partners



# CAS

CENTRE FOR  
AUTONOMOUS SYSTEMS

The Centre for Autonomous Systems is the gateway to a unique environment established on 3<sup>rd</sup> October 2015 to facilitate and accelerate the growth of the Unmanned Air Systems (UAS) industry. Centre for Autonomous Systems is the first UAS research, training and development range of its kind among Indian educational institutes. With safety and training, UAV operations are delivered by School of Aeronautical Sciences, HITS

## Research Areas

Unmanned air systems R&D, Integrated unmanned air systems operating environments, Expert technical and operational support, Outstanding infrastructure and test facilities, Development and demonstration flight trials, Drone Training.

Beyond Visual Line of Sight (BVLOS) Testing of Drones.

## Research Activities

- ▶ Design & Testing of Rukma Vimana vertical take-off and landing (VTOL) UAV is in progress.
- ▶ Low Cost Agricultural drone for Pesticide Spraying – in progress.
- ▶ Swarm of drones (pairing of master & slave drone) – in progress.
- ▶ High Payload Fraction Fixed wing UAV is successfully fabricated & tested.
- ▶ Hybrid wing UAV for HALE is in progress- collaborating with industry
- ▶ UAV with SMA as control surfaces is in progress.
- ▶ BVLOS Testing of Drones.

## Centre Activities

HITS in association with Orient Flight Aviation Academy are giving drone pilot training. Our team includes both operational and subject specialists with experience in all aspects of RPAS engagement and deployment. Our Instructors are DGCA certified Drone pilots and we are actively engaged with industry leaders in the integration of Remotely Piloted aircraft systems into real world programs.

Recognizing DGCA Safety Regulations trainees are encouraged to develop safe attitude while flying Drones. Upon completing the course, trainee will be able to Identify different types of Drones & will have a clear understanding on fundamentals of Flight (Aerodynamics), ATC procedures & Radio Telephony, different regulations of DGCA, Civil Aviation Requirements, Weather and meteorology.

## Research Outcomes

- ▶ Team “Striker” won first prize in “FLIGHT FURY” an Aeromodelling Competition conducted by IIT ROORKEE (Cognizance 2023) and bagged cash prize of Rs. 2 lakhs out of 30 teams.
- ▶ Team “CYBROID” participated in SCIMIT ‘23, a Mega Project Contest held at Manakula Vinayagar Institute of Technology, Pondicherry and the team won 1<sup>st</sup> place with a cash prize of Rs. 25,000 and many similar competitions are won by our student members.
- ▶ “JAIHIND - 1S” is an experimental satellite which weighs only 33.39 grams (which was awarded “lightest micro satellite” by India book of records & URF world of Records). The satellite is especially made for the competition conducted by Colorado space Grant Consortium, NASA and idoodle-learning and selected among 800 applicants worldwide.
- ▶ Team “Jhatayu” was awarded by “Asia Book of Records” & India Book of Records as “Asia First Flying Bike”. This is the first project of the University entered into the Asia Book of Records.

CONTACT

**Mr. G. Dinesh Kumar**

**Head, Centre for Automation System**

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# 10

CENTRE FOR SIMULATION  
AND ENGINEERING DESIGN  
(SIMENDES)

ESTABLISHED

18 AUGUST 2015

## Vision:

To develop and deliver Innovative Product Designs harnessing the intellectual capabilities of Academia for the demanding needs of Industry.

## Mission:

- ▶ Creating a collaborative platform for Rational & Innovative product designs
- ▶ Adopting PLM - Product Life Cycle Management Approach
- ▶ Establishing as a leading center for Value Added Training in Advanced CAD, FEA & Product Design.

Research Partners





The Center for Simulation and Engineering Design (SIMENDES) has been established to promote research and training on Product Design adopting the latest practices of PLM (Product Life Cycle Management). This will include reverse engineering practices also. The center will deliver high quality product designs in a timely and cost-effective manner. The software enables the full spectrum of next generation collaborative design including system engineering, shape design and equipment engineering.

### Research Areas

Product Modeling, Design, Simulation & Analysis: Finite Element Analysis of Composite Products and Structures in ANSYS ACP. Composite Pressure Vessels & Piping, Rapid Prototyping: 3D printing, Reverse Engineering.

### Research Facilities

#### 3D Modeling & Finite Analysis Softwares:

CATIA PLM Discover Pack: 30 License

- ▶ CATIA V6 Advance Design Pack
- ▶ DELMIA V5 Master Design Pack
- ▶ SIMULIA V6 Master Design Pack

ANSYS Academic Research License - Full Version with ALL Modules

- ▶ Mechanical (Structural, Thermal, Static & Dynamic)
- ▶ CFD – ANSYS FLUENT & CFX – Turbo machinery
- ▶ High End Workstations
- ▶ Advanced 3D Printers for Rapid Prototyping

### Research Outcomes

#### Publication

Over 30 research articles in Scopus Indexed Journals.

#### Funded Projects

Development of Composite Track guard Fuel Tanks with Polyurea Coating on the Striking Face for Futuristic AFV - CVRDE (DRDO). This project is a full-scale product development work using new composite material system involving all phases of product design activities like CAD modeling, Finite Element Analysis for Structural integrity and Impact strength, Static & cyclic pressure testing and finally the bullet resistance testing.

#### Consultancy Projects

Design of Large Diameter Glass Fiber Reinforced Plastic (GRP) Storage Tanks for combined loads including seismic loads

CONTACT

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**Head, SIMENDES**

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# 11

**CENTRE OF EXCELLENCE  
IN UNDERWATER ROBOTICS  
AND COMMUNICATION  
(UROC)**

**ESTABLISHED 30 SEPTEMBER 2022**

**Vision:**

To establish international standard research network in the areas of underwater technology focusing on the development of autonomous vehicle, communication networks, IOT signal processing, and smart nanomaterials for underwater devices.

**Mission:**

To improve technical merits of underwater vehicles and devices by employing emerging next generation smart materials. To integrate fundamental research into high-end underwater technological requirements through advanced research approaches in the fields of Physics of materials and devices. To establish the Centre of Excellence as potential service provider for various fields focusing on the underwater technologies.





Various underwater technologies have been developed for tracking and surveillance of marine ecosystem based on fundamental physical principles such as optical, acoustical and RF. It has been realized that a technical integration of various research thrust areas is an essential requirement to establish a highly product-oriented approach to develop underwater devices. Centre of Excellence in Underwater Robotics and Communication was established on 30 Sept. 2022 to focus on six major thrust areas through which various research verticals of ocean engineering and technology are explored.

### Research Areas

- ▶ Design and Development of Bio/Nature Inspired Underwater Vehicles for Ocean Surveillance.
- ▶ Functional Nanomaterials and Devices (Photovoltaics, Photodetectors, Smart Sensors) for Underwater Applications.
- ▶ Development of Optical, Acoustical and RF-Communication Network for Underwater Applications.
- ▶ IOT Signal Processing using Artificial Intelligence & Machine Learning.

### Research Facilities

High End Workstations

### Research Outcomes

#### Funded Project

Irradiation Enabled Defects Mediated Charge Transport in 2D-Layered Van der Waals Heterostructure for Photovoltaics Applications - UGC-DAE Collaborative Research Scheme (2022).

#### Patents

- ▶ Weavable-Wearable Fiber Solar Cells for Smart Nanotextiles. German Patent.
- ▶ Compact Planar Stripline Bowtype Antenna for Sub-7GHz / Vo5G Applications.

CONTACT

**Dr. S. Mariyappan Shanmugam**

**Head, URoC**

**Email:** smari@hindustanuniv.ac.in

# 12

STRUCTURAL IMPACT  
AND CRASH SIMULATION  
CENTRE  
(SIMCRASH)

ESTABLISHED

12 JANUARY 2017

## Vision

- ▶ To become a centre of excellence for designing and development of structural systems for structural impact and crash related technologies.

## Mission

- ▶ To asses, design, simulate and integrate advanced state of art technologies for impact and crash proof design of systems for industry and Defence forces.

## Research Partners

 Ansys



 KAIZENAT  
Keep Improving

 IndAIR

 HAYTEL  
AEROSPACE

 NAFA

 LSTC  
Livermore Software  
Technology Corp.



Structural Solutions  
Private Limited



Structural Impact and Crash Simulation Centre (SIMCRASH) was established on 12<sup>th</sup> January 2017 to promote educational and research activities in the field of structural impact and crash analysis. The centre bridges the gap between the industries, research institutes and the University with a distinct capability to harness the intellectual energy of academia to solve the real time problems faced by the industry and the Defence forces. SIMCRASH is a multi-disciplinary research centre dedicated for solving real world structural impact and crash problems through the application of modelling and simulation techniques and to develop new approaches in material modelling for structural impact crash problems.

### Research Areas

Impact and Crash, Hail ice Impact, Fatigue and Fracture, Traumatic Brain Injury (TBI), Bird Strike, Underwater Explosion, Water Entry Shock, Mine Blast.

### Research Facilities

- ▶ LS Dyna – 8 Licenses
- ▶ High end workstation -1Nos
- ▶ Ballistic Test facility
- ▶ Hail ice impact facility
- ▶ Fatigue test Machine –MTS 100kN
- ▶ Drop weight Test
- ▶ Drop test facilities- 5m height

### Research Outcomes

#### R&D projects

- ▶ Evaluation of Numerical Bird Model Parameters Through the Dynamic Test of Bird Projectile” Sponsored by GTRE, DRDO.
- ▶ Experimental and Numerical investigations on the failures of metallic and composite structures to hail- ice impact Sponsored by ARDB, DRDO
- ▶ Simulation of Traumatic Brain Injury Using Finite Element Method” Sponsored by HITS.
- ▶ Coupled Fluid-Structure Interaction Studies Due to Underwater Explosion Around Submerged Composite Pressure Hull” Sponsored by NRB, DRDO.
- ▶ Estimation of Shock Levels and Its Impact on the Underwater Axi-Symmetric Bodies Due to Water Entry and Pyro Shock” Sponsored by NSTL, DRDO.
- ▶ Development of shock standards and guideline for two different marine vessels through numerical simulations.
- ▶ Experimental and numerical investigations on the failures of metallic and composite structures to hail ice impact.
- ▶ Parametric studies on articles subjected to underwater shock wave excitation.
- ▶ Fatigue testing of composite specimens.

**CONTACT** **Dr. K. Ramajeyathilagam**  
**Head, SIMCRASH**  
**Email:** simcrash@hindustanuniv.ac.in

# 13

DR. KCG VERGHESE  
HIGHER EDUCATION,  
LEADERSHIP &  
MANAGEMENT CENTRE  
(HELM)

ESTABLISHED

12 JANUARY 2017



## **Vision**

Shaping the future of higher education institutions across the globe through continual innovation in educational leadership, management, research and contribution to society.

## **Mission**

Excellence in value based Education and quality Research through an innovative learning environment for the development of human resources.



## HIGHER EDUCATION, LEADERSHIP & MANAGEMENT CENTRE

Dr. KCG Verghese Higher Education Leadership and Management (HELM) centre will work towards transparency in higher education, strengthen leadership of higher education reforms, foster and facilitate implementation of reform across the country. For example, the centre will help the stakeholders to develop policies, materials, outreach, training, and assistance programs conducive to system-wide adoption and implementation of the leadership and management approaches. Most of the Quality Standards for accreditation state that assessment principles are complementary to the institute's mission. Educational institutes are a system of inter-dependent processes, comprising of collection of highly specialised teaching faculty, linked within a functional hierarchy. The objective of Quality management is to continuously seek a better way of imparting education to the students.

### Objectives

- ▶ To provide professional guidance & education to nurture the educational leadership to the stakeholders to enable India to gain popularity in Higher Education Institution and attain its lost glory
- ▶ To provide guidance for Indian institutions to scale up in the global rankings
- ▶ To provide consultancy to institutions to achieve quality standards imparting education and skill development of students

### Centre Activities

- ▶ Dr. K.C.G HELM Centre and Office of International Affairs Organized an Interactive Session on "Circular Economy" on 10 June 2023 with Mr. Pablo Gandara, IURC (International Urban & Regional Cooperation) Team Leader, Asia & Australasia.
- ▶ To cherish the International Mother Language Day, Matribhasha Diwas was conducted by the Department of Languages in association with Dr. KCG Verghese, HELM (Higher Education Leadership Management) Centre on 21st February 2023.
- ▶ An International Guest Lecture on "Being a Great Leader" was jointly organized by the School of Management and Dr. K. C. G. Verghese Centre for Higher Education, Leadership and Management (HELM) on 24 April 2023.
- ▶ The Centre in association with Department of Languages of Hindustan Institute of Technology and Science, organized an International Conference on Migration Challenges and Prospects on March 31st, 2023. The conference aimed to explore the historical and cultural significance of the migration of Syrian Christians to the Oriental Region in the 9th century AD.

CONTACT

**Dr. Akkara Sherin**

**Head, HELM**

**Email:** helm@hindustanuniv.ac.in



14

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**CENTRE OF EXCELLENCE  
FOR HARDWARE  
INNOVATIVE TEST  
TECHNOLOGY SYSTEMS  
(E-HITS)**



Hindustan Institute of Technology & Science (HITS) partnered with QMAX, established a world-class automated electronic hardware test engineering facility to train and serve Government, Private R&D organizations, Educational institutions at the National / International levels to meet the future demands in test engineering and focus on capacity building. Currently, there is a need for innovative test solutions for high density PCB electronic systems. Henceforth E-HITS is oriented towards test and diagnose faults in Electronic Systems starting from the component level to the system level tests.

### Objectives of E-HITS

E-HITS provides extensive training on various Electronic testing, functional research support to develop test software for validation of PCB, conduct R&D for device characterization and modelling. Overall, E-HITS aims to carry out various training and R&D activities to strengthen capacity of Electronics engineers in hardware testing

### Research Facilities

- ▶ QTouch - Dual Probe Flying Probe Tester
- ▶ Prorack ATE V250- 128128/4
- ▶ QT200 Nxd Desktop PCB Tester - 48192/3
- ▶ QT55 V-I Signature test trainer
- ▶ QT65 - ICFT Trainer System
- ▶ QE49 BS Test Trainer System
- ▶ QT-Hi1 Nodal Impedance Analyzer
- ▶ QT-25 PCB Shorts Locator
- ▶ Training Boards
- ▶ Denon SC7000Z Desoldering Tool
- ▶ Monarch M70 Temperature controlled Soldering station

### About the courses:

#### Basic Training Course in Test Engineering for Electronics Hardware

Introduction to test engineering | Fundamental principles in test engineering | Standard methodologies | PCB testing techniques | Laboratory procedures Intermediate Technical Training Course in Test Engineering for Electronics Hardware Boundary Scan Test Techniques | Reverse Engineering using schematic generation using automated techniques | Test Program Sets (TPS) development on QMAX Automated Test Equipment platform | Advanced testing concepts such as BS tests | Testing using Robotic Flying Probe Testers etc.

#### Advanced Development Training Course in Test Engineering for Electronics Hardware

Different types of advanced and emerging test technologies | Test interface adapters development using Automated Test Equipment | Flying Probe Testers for PCB assemblies | Advanced test engineering concepts such as Design for Testability rules, Test Program Sets (TPS) and Test Interface Adapters development on QMAX Automated Test Equipment platform.

CONTACT

**Dr. AL.Vallikannu**

**Head, E-HITS**

**Email:** ece@hindustanuniv.ac.in

50+

Funded Projects



### Naval Science & Technological Laboratory (NSTL)

- ▶ Parametric studies on article subjected to underwater shock wave excitation
- ▶ Development of shock standards and guidelines for two different marine vessels through numerical analysis

### Department of Atomic Energy(DAE)

- ▶ Development of Inspection Robot
- ▶ Active Noise Reduction



### Defence Research and Development Organisation (DRDO)

- ▶ Ultra response Gas Purging System
- ▶ Composite Fuel Tank for MBT
- ▶ Development of Eddy Current Sensors & Electrostatic Sensors
- ▶ Wall Climbing Robot
- ▶ Tactical Training Simulator
- ▶ On-line Measurement system for Hydrogen Concentration in Steam Environment
- ▶ Experimental and numerical investigations on the failures of metallic and composite structures to hail-ice impact



### Department of Science and Technology (DST)

- ▶ Development of Lead Free high performance piezoelectric materials
- ▶ Distance based topological indices problems in cheminformatics
- ▶ Edge Saturated Si<sub>2</sub>BN Nano-Ribbon as High-Capacity Anode Materials for Next Generation Mg Ion Batteries
- ▶ Sn integrated 3D, porous carbon based Scaffolds as high capacity anode for Sodium-ion batteries
- ▶ carbon based materials with high antibacterial activity for face mask application to combat COVID-19
- ▶ Development of highly efficient direct Z-scheme heterostructure photo catalyst based on 2D metal sulfide for CO<sub>2</sub> reduction
- ▶ Adaptive control of robotic fettling for asymmetric geometry and close tolerance cast components



सत्यमेव जयते

Department of Science and Technology  
Ministry of Science and Technology  
Government of India



GLOBAL  
INNOVATION &  
TECHNOLOGY  
ALLIANCE

- ▶ Probing the dynamic photocatalytic CO<sub>2</sub> reduction activity and interface carrier transport of direct Z-scheme heterostructure based on in-situ spectroscopy





# ROYAL ACADEMY OF ENGINEERING

## Royal Academy of Engineering

- ▶ Autonomous Heterogeneous Robotic Swarm Simulator for Faster Disaster Reconnaissance and Mitigation
- ▶ Mobile wall climbing robot for the internal non-destructive testing (NDT) of storage tanks
- ▶ Austempered Ductile Iron for Automotive Components
- ▶ Virtual Power Plant for Real Time EMS
- ▶ Automated 3-D Ultrasonic Inspection System

## DAAD

Deutscher Akademischer Austauschdienst  
German Academic Exchange Service

## German Academic Exchange Service (DAAD)

- ▶ German -Indian R & D study on innovative concepts for traffic and vehicle safety



सत्यमेव जयते

Government of India

National Board for Higher Mathematics



**icmr**  
INDIAN COUNCIL OF  
MEDICAL RESEARCH  
Serving the nation since 1911

## Indian Council of Medical Research (ICMR)

- ▶ Anti-cancer drug response prediction model Development

## National Board of Higher Mathematics (NBHM)

- ▶ Embedding Problems in Networks and Applications



सत्यमेव जयते

Ministry of New and Renewable Energy  
Government of India

## Department of New and Renewable Energy (MNRE)

- ▶ Cyber-physical Controller for Hybrid Energy-Vertical Axis Windmill
- ▶ Hybrid Vertical Axis Wind Turbine System for Low Wind Speed Regimes

Financed projects  
for an amount of

**Rs.20cr**

# RESEARCH NETWORKS

## **WORLD TECHNOLOGY UNIVERSITIES NETWORK**

WTUN is a network of global technology universities committed to undertaking cutting-edge, challenge-led research with direct benefits to people and society and providing education for the next generation of global citizens who will have to respond to the world's 21<sup>st</sup> century challenges. Technology universities are at the heart of the 21<sup>st</sup> century information revolution, with countries worldwide competing aggressively to build knowledge economies. As a founding member of the World Technology Universities Network (WTUN), Hindustan Institute of Technology and Science (HITS) has proven to be committed to actively participating in the network's activities.

## **MITACS GLOBALINK RESEARCH INTERNSHIP**

The Mitacs Globalink Research Internship Programme offered by Mitacs is a non-profit organisation in Canada that attracts students to intern at various universities in Canada. Adithiya Krishna Muthuraman, a student in chemical engineering, completed the 12-week internship programme under the scheme.

## **THE ASSOCIATION OF UNIVERSITIES OF ASIA AND THE PACIFIC (AUAP)**

The AUAP promotes and helps enhance mutually beneficial cooperation among educational institutions in relevant areas and is dedicated to rendering such services to its member institutions. The research funding initiative is a testimony to implementing the mission of the AUAP to promote a culture of quality, innovation, and research in the higher education sectors in Asia and the Pacific region. HITS is a valid member of the AUAP and is invited to submit proposals as per the prescribed application form to avail of the research grants offered by the AUAP. The objective of the AUAP funding for 'Research Capacity Building' is to ensure research collaboration, networking facilities, mobility, etc., among the member institutions of the AUAP.

## **INTERNATIONAL URBAN AND REGIONAL COOPERATION**

The new International Urban and Regional Cooperation (IURC), Asia and Australasia (AA) programme was officially launched in India in the IURC Forum with over 24 cities across the globe participating on 24 February 2022. Towards the aim and formulation of city-to-city pairing, IURC Asia and Australasia division in its current proposal facilitates an European city to pair with an Indian city to implement projects of concrete authority based on sustainable goals. In this proposal of IURC, Hindustan Institute of Technology and Science contemplates to undertake a pilot study in the District of Chengalpattu near the City of Chennai, Tamil Nadu along with the Trier University of Applied Sciences, Germany to launch bilateral and multilateral cooperation through city-to-city pairings for networking at global level to realize measures for an ecologically sustainable and greener development. HITS hosted the Letter of Intent (LOI) between District Rural Development Agency, Government of Tamil Nadu and the City of Trier, Germany. The pilot study would entail Indo-European expertise and cutting-edge technologies within the framework of the program to develop a "Zero Emission Region" and study its viability and substantiality to benefit the regional inhabitants and the surroundings. Apart from the city to city pairing, IURC also supports

academic exchange through which our student Mr. Annamalai, MBA (Green Business) has been offered scholarship at Umwelt Campus Birkenfeld, Germany.

### **DAAD ACADEMIC EXCHANGE PROGRAMME AND FUNDED PROJECTS**

By providing funding for people from all the countries of the world and facilitating diverse intercultural encounters, the German Academic Exchange Service (DAAD) strengthens diversity and mutual understanding. Under the supervision of Dr. M. Jaikumar, Head, Automobile Engineering, many funded projects are carried out to develop innovative concepts for traffic and vehicle safety. The projects are "Development of Safe Traffic Infrastructure (Vision Zero Guidelines)", "Assist functions for automated e-calls and for drive style feedback" and "Vehicle Safety (Bus and Coach Safety, Seat Development, Crash, and Occupant Simulation)".

### **GLOBAL AUTOMOTIVE RESEARCH CENTRE**

The revolution of Industry 4.0 instigates Industry-Institute collaboration to bridge the technological gap between institutes and industries. With this aim, Hindustan Institute of Technology and Science has proposed a Memorandum of Understanding (MoU) with Global Automotive Research Centre (GARC), Chennai towards offering joint programmes. The courses will be designed to help students learn the advanced design, manufacturing and testing practices in the automotive industry.

### **DEUTSCHE AKADEMIE FÜR DIGITALE BILDUNG**

DADB or German Academy of Digital Education – is an academy working to digitalise higher education, where Germany enjoys an unparalleled global reputation, especially in engineering. DADB – German Academy of Digital Education have signed an MoU for the launch of Blended Learning Course – 5G Technology. This collaboration aims to offer students to future oriented education across all backgrounds. The MOU was signed in presence of Mr. Ashok Verghese, Director, HITS; Dr.-Ing. Carsten Schroeder, CEO & Founder, DADB alongside Mr. Neleesh, MD, DADB; Mr. Shone, Operation Lead, DADB India Pvt Ltd.

### **ROYAL ACADEMY OF ENGINEERING (RAE)**

The Royal Academy of Engineering, United Kingdom, International collaboration that brings together some of the world's leading problem-solvers to address the great challenges of our age. The Academy runs UK and international programmes to support the pursuit of engineering research and innovation and to advance engineering's contribution to a safer, healthier, and more prosperous world. Through our prestigious Newton Awards, we recognise and reward the best engineering talent whose achievements have a huge impact on society. Under the supervision of Dr. RM. Kuppan Chetty, Head, Centre for Automation and Technology (ANRO) and Department of Mechatronics Engineering, about six funded projects worth Rs. 300 lakhs are carried out in the areas of robotics, automation, and non-destructive evaluation. The key projects are the "Design and Development of Wall-Climbing Robots for inspection of vertical storage tanks" and the "Development of Robotic Swarm Simulator for faster disaster reconnaissance" worth about 102.60 lakhs.

# SEED GRANT



The Hindustan Seed Grant (HSG) scheme, facilitated by HITS, extends financial support to regular Faculty (Associate Professor/Assistant Professors) for Seed Grants or Minor Research Projects, subject to approval by an expert committee appointed by the Vice Chancellor. Each faculty member may only lead one such project/grant at any given time, with the stipulation that ongoing projects must be concluded before new proposals are considered. The Principal Investigator bears sole responsibility for the success or failure of the project and any breach of established guidelines will result in disqualification from future participation in the HSG Scheme.

The financial aid provided for research projects amounts to a maximum of 5.0 Lakhs, disbursed in two installments to cover both recurring and non-recurring expenses. Principal Investigators are obligated to produce a minimum of two papers in peer-reviewed indexed journals (SCI/Scopus/UGC CARE), or contribute to a Book/Book Chapter, in addition to presenting their work at a National/International Conference/Seminar before project completion.

The following projects have been chosen for the Hindustan Seed Grant (HSG) scheme and have received approval for the first installment of funding.

# INTELLECTUAL PROPERTY

**TOTAL PATENTS - 280**  
**PUBLISHED - 170**

**GRANTED**  
**111**

**NATIONAL**  
**31**  
**INTERNATIONAL**  
**80**

# MAJOR INNOVATIONS

**World's Lightest Satellite**



**Road Cleaning Robot**



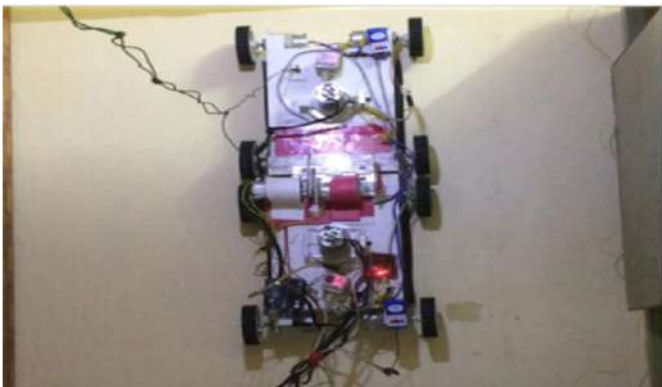
**Flying Bike**



**Pond Cleaning Robot**



**Inspection Robot**



**Wall Climbing Robot**



**Scooping Robot**



**Solar Panel Cleaning Robot**



**Suzhali**  
(PAPR - Powered Air Purifying  
Respirator)



**Sevili (Mobile Service Robot)**



**Tapioka Harvester**



# DR. K. C. G. VERGHESE RESEARCH AND RESOURCE CENTRE



## THE LIBRARY

The Library is housed with well stocked with more than 1,17,246 book volumes, 389 print back volumes of International and National Periodicals, more than 3,500 CDs and DVDs, more than 42,000 Electronic Journals, and more than 22,5542 Electronic Books with Online Databases, including those from IEEE, SAE International, AIAA, SPRINGER LINK, SCENCE DIRECT, PROQUEST, and EBSOC with Remote Access, among others. The Digital Library has 60 Apple IMAC systems and 10 IPATE systems with Wi-Fi internet connectivity so that Academics, Research Scholars, and Students can access Online Electronic Information Resources. Students are allowed to borrow laptop computers and Kindles in addition to the sixty iMac systems. Students can use the library's additional 25 computers to access the OPAC and E-Resources. The institute's teaching, research, and extension programs are supported jointly by the central library and departmental libraries. A good place for users to begin their search for Kindle.





**2.5**  
**Lakh Books**

**20+**  
**Research**  
**Databases**

**4500 Sq.m.**  
**Carpet**  
**Area**  
**814 Sq.m.**  
**Reading**  
**Area**

**600+**  
**Seats for**  
**Readers**

**700+**  
**Subscriptions to**  
**Journals**

**Digital**  
**Repository**

Books **338133**  
Journals **47262**  
Thesis **403**  
Project Reports **3998**  
CDs **3200**  
News Papers **15**

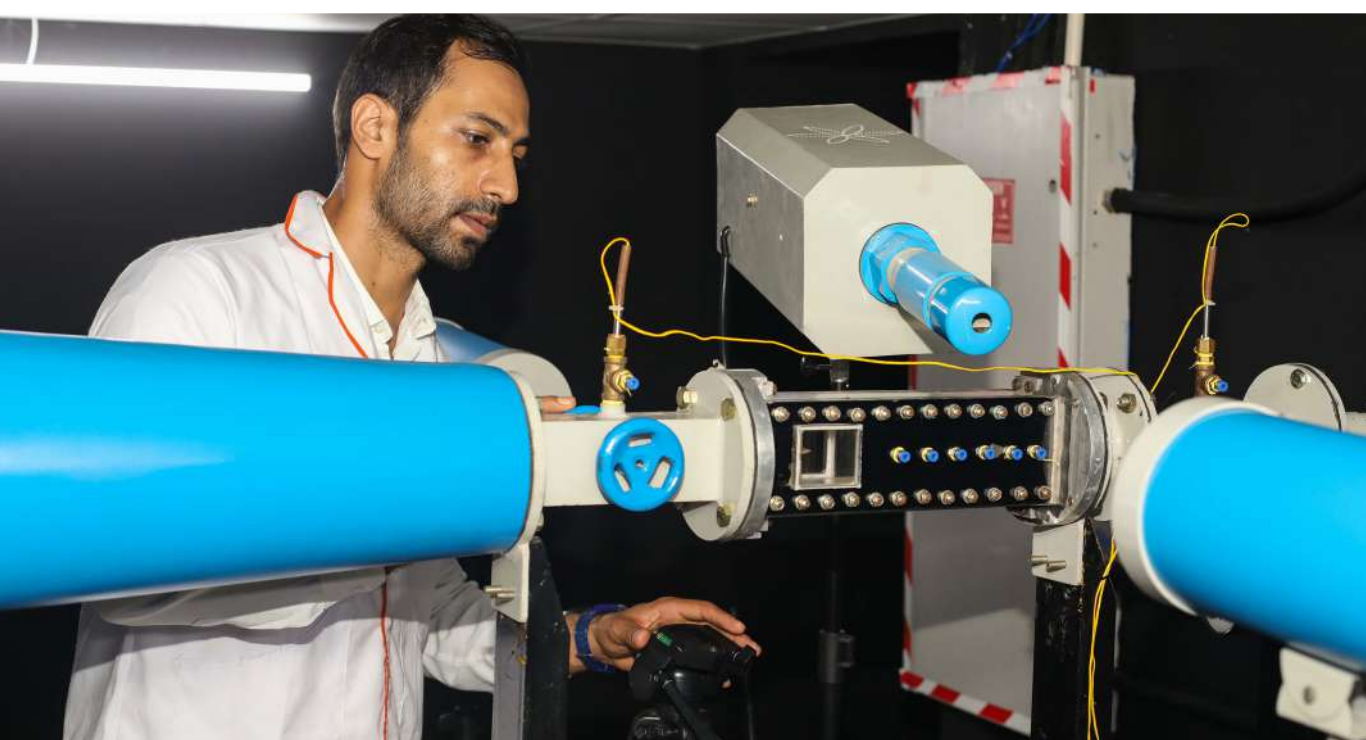
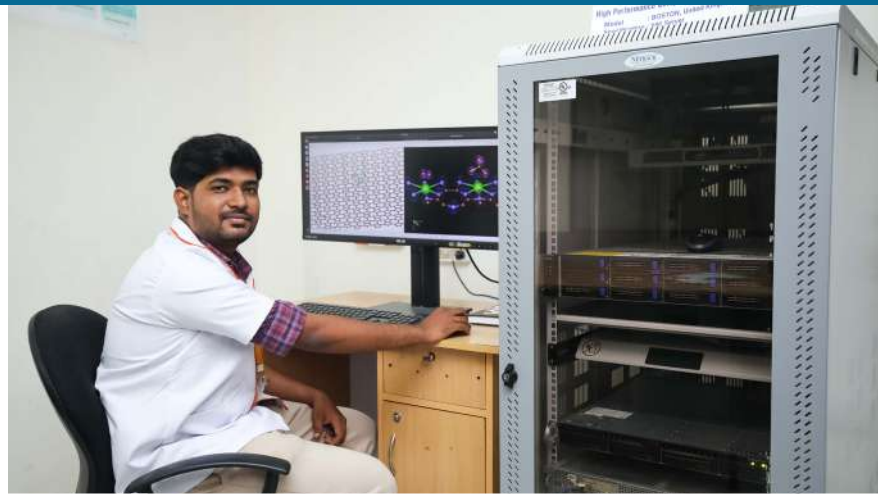
## RESEARCH SUPPORT SERVICES AND OUTREACH PROGRAMS

The section also has the responsibility to conduct Author/Publishing Workshops and to help the users in making use of the academic writing and research tools including Turnitin, Urkund, Mendeley, JSTOR, RStudio, Python, Jupyter, SPSS, MATLAB, different online bibliographic and full-text databases, eBooks, etc. We further plan to strengthen research services, help to discover and access library and archival materials, data, and e-resources and to focus students' research on a topic, projects and partnerships between the Libraries and research community, to arrange Workshop Specialists to provide instructions on research methods Digital Library has iMAC, iPad, Laptop and Kindle with Internet Connectivity and also Wi-Fi for the students to access the Online Electronic Information Resources, online journals, CDs etc. Apart from these computers, the library has another 8 computers for the students to access OPAC.

## CONDUCTIVE ENVIRONMENT

HITS has a well-stocked modern centrally air-conditioned Library and unique building centered on a beautiful six-story curved glass wall, reinforcing the Architect's commitment to incorporating natural lighting into the design scheme. It is a most lively place on the campus providing a safe, comfortable, and friendly environment that enables learning, advancement of knowledge, and promotes discovery. The rooftop features spectacular views of Kovalam Beach and is adorned with landscaped gardens and grounds.

# RESEARCH @ HITS





# LIST OF HONORIS CAUSA AWARDEES

2011



**Dr. Ashok Nayak**  
Former Chairman, Hindustan Aeronautics Limited, Bangalore.

2012



**Dr. Vijay Kumar Saraswat**  
Member, NITI Ayog, Govt. of India  
Former Director General of DRDO.



**Dr. Abdul Razzaq Ali Issa Al Sabbagh**  
Chief Executive Officer, Bank Muscat, Sultanate.



**Dr. Mallika Srinivasan**  
Chairperson & CEO, Tractors and Farm Equipments Ltd.



**Dr. M. Narendra**  
Former Chairman & MD, Indian Overseas Bank.

2013



**Dr. V. Sumantran**  
Vice Chairman, Ashok Leyland, Chennai.



**Dr. B. Santhanam**  
Managing Director, Saint Gobain Glass India Pvt. Ltd.

2014



**Dr. Tessy Thomas**  
Director, Advanced Systems Laboratory (ASL), DRDO, Ministry of Defence



**Dr. Hee Ok Kim**  
President, Dongguk University, South Korea

2015



**Dr. Isa Abdullatif Alansari**  
Chief Operating Officer, Aluminum Bahrain.



**Dr. Berndt A. Buchmann**  
Director, Volkswagen Group India After Sales & Vehicle Logistics.



**Dr. A. S. Kiran Kumar**  
Former Indian Space Scientist, Chairman of ISRO

2016



**Dr. Sekhar Basu**  
Chairman, Atomic Energy Commission & Secretary Dept. of Atomic Energy.



**Dr. Ravindra Kumar Tyagi**  
Former Chairman, Hindustan Aeronautics Limited & President, Aeronautical Society of India



**Dr. Amithabh Matto**  
Prof, Jawaharlal Nehru University & University of Melbourne

2017



**Dr. S. Christopher**  
Former Chairman, DRDO.



**Dr. Mecca Rafeeqe Ahmed**  
Businessman & Entrepreneur, Farida Group of Companies.



**Dr. Alex Jacob**  
Managing Director and Sr. Structural Consultant, United Consultants



**Dr. Narain Karthikeyan**  
International Formula One Racing Driver

2018



**Dr. Lalit Gupta**  
Joint Director General of Civil Aviation, DGCA, New Delhi



**Dr. E. Sreedharan**  
Principal Advisor, Delhi Metro Rail Corporation (DMRC)

2019



**Dr. V K Mathews,**  
Executive Chairman, IBS Group Trivandrum



**Dr. Bala K Baradwaj**  
Managing Director, Boeing India Engineering & Technology Centre, Bengaluru & President SAEINDIA



**Dr. Tony Thomas**  
Corporate Vice president and Chief Information Officer, Global IS/IT Nissan Motor Company Ltd. Japan.



**Prof. Col. Dr. James Thomas**  
Principal Advisor and Former Vice Chancellor, Dr.D Y Patil University, Navi Mumbai

2021



**Dr. Kris Gopalakrishnan**  
Co-Founder, Infosys.

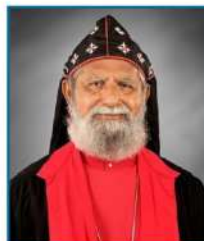


**Dr. H.E. Grace Akello**  
Ambassador of Uganda to India

2022



**Dr. S.Somanath**  
Chairman, ISRO, Secretary, Department of Space, Govt. of India



**Dr. Rt. Rev. Joseph Mar Barnabas Suffragan Metropolitan**  
Malankara Mar Thoma Syrian Church

2023



**Mr. Pablo Gandara**  
Team Leader, International Urban Regional Cooperation (IURC) Project of Europe and Asia / Australasia



**Mr. Sudhanshu Mani**  
Retd. General Manager, Integral Coach Factory

# INTERNATIONAL TO STRENGTHEN RESEARCH,



**HINDUSTAN**  
INSTITUTE OF TECHNOLOGY & SCIENCE  
(DEEMED TO BE UNIVERSITY)

# AGREEMENTS EDUCATION AND TRAINING





Centre for Research & Consultancy  
(Founder's Block)



**Address:**

**Centre for Research and Consultancy**

1, Rajiv Gandhi Salai, Old Mahabalipuram Road, Padur,  
Kelambakam, Chennai, Tamil Nadu 603103, India.

**Web:** [www.hindustanuniv.ac.in](http://www.hindustanuniv.ac.in)

**Email:** [researchoffice@hindustanuniv.ac.in](mailto:researchoffice@hindustanuniv.ac.in)