

# Indo Universal Collaboration for Engineering Education Annual Highlights 2021

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## Preface

If there was ever a time in which strengthening engineering education and empowering young engineers were paramount, now is that time. In 2021, the second year of global crisis of COVID-19, we continued our important work of supporting young engineering students to grow more resilient and build a more sustainable world.

**Our Mantra** “I am teaching, are they learning?”

**Our Vision** is to improve the quality and global relevance of engineering education in India.

**Our Mission** is to build an ecosystem for transforming engineering education in India with the assistance of engineering education experts and industry from around the world.



## Empowering Faculty

Quality of faculty is at the core of the teaching and learning process. It is important that faculty are empowered to teach using a student centric and outcomes-based approach.



### **IUCEE International Engineering Educator Certification Program**

**(IIEECP)**, our signature program, recognized by IGIP, Austria, is offered - by a team of our global experts. We have certified almost 1000 faculty all over India since 2016. It has been revised and restarted after a gap due to the pandemic. We now have 145 faculty enrolled in the program for Spring 2022. This program will be offered regularly twice a year. Special offerings are organized on demand.

**Faculty Empowerment Courses** are offered regularly throughout the year, with the help of our global experts. **During 2021:**

- “Teaching Professional Ethics” was offered to 97 Faculty and 175 Students.
- “Clean and Green Campus” was offered twice to a total of 85 faculty.
- “Community Projects using Design Thinking” was offered to 51 faculty.
- “Basics of Project Based Learning” was offered to 71 faculty.
- “Foundation Course in Research Methods” was offered twice to a total of 87 faculty.
- “Engineering Education Research” was offered to 20 faculty.
- “Pro Researcher Mindset” was offered to 29 faculty.

The above courses are scheduled to be offered every year.

Additional courses will be offered based on demand and availability of experts.

**Mini Symposia (MS)** have been initiated in 2021, in order to enable sharing of best practices in various dimensions of teaching and learning. Papers submitted are published in Proceedings.

- “Problem and Project Based Learning MS” has been held with 145 participants.
- “Smart Clean, Green and Sustainable Campus MS” has been held with 205 participants.
- “Teaching and Learning MS”, “Industry Academy Collaboration MS” and “Outcomes Based Education MS” are being planned.

**Cluster Meetings**, coordinated by global experts, are conducted once a month for informal sharing on the following topics. Average attendance during 2021 has been 25. Cluster Meetings will be scheduled and continued in 2022.

- Outcomes Based Education
- Teaching and Learning Centers
- IIEECP Certified
- Entrepreneurship
- Industry Academy Collaboration
- Interdisciplinary Engineering
- Problem Based Learning

**IUCEE Teaching and Learning Centers** have been formed at many IUCEE institutions with support from IUCEE. These and emerging ones will be mentored in 2022, in order to assist systemic transformation at institution level.

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## Catalysing Leadership

Central to the Mission of IUCEE is the **Annual Leadership Summit** which has been held since 2018. The objective is for leadership teams of IUCEE institutions come together and share their strategic initiatives and challenges. The Summit is normally held in Goa, but was conducted virtually in 2020 and 2021.



Annual Leadership Summit 2021 July 9, 10, 11 Virtual was attended by 298 participants representing 45 institutions. The themes were

- 1) Preparing Graduates for INDUSTRY 4.0
- 2) Fostering ENTREPRENEURSHIP in Graduates
- 3) LEADERSHIP for Implementing NEP Guidelines

### Courses for Academic Leaders were conducted

- “Project Management for NEP 2020” was offered to 21 academic leaders
- “Leadership for NEP 2020” Course was offered to 16 administrators/leaders.

**IUCEE NEP 2020 Pilot** is in Implementation: Engineering students need to realize that the real world is holistic and multidisciplinary. This is clearly emphasized in the National Education Policy (NEP) 2020. The best time to start is in the First Year, so that students start seeing the relevance of the courses they are taking as part of the conventional curriculum.

IUCEE NEP 2020 pilot has started with 36 institutions, 1,750 first year students and 500 faculty. The six mini courses offered by IUCEE global experts this semester are:

1. Community Projects using Design Thinking
2. Clean and Green Campus
3. Entrepreneurial Thinking
4. Social Emotional Learning
5. Artificial Intelligence for All
6. Leadership and Sustainability

Students in these mini-courses work in teams and do assignments which will start imparting important professional skills required by NBA (team, communication, awareness of social responsibility, project management and life-long learning). We will assess this pilot with the help of all the participants and faculty and plan to scale up to larger numbers of students starting next year.

Leadership and Faculty of IUCEE institutions have prepared for this during 2021 with the help of global and industry experts including Mr. Parasuraman of Toyota, for TQM and Mr. Dinakar of Samuthana for Critical Thinking. Mr. Sharad Marathe of UTS led the effort to modify first year curriculum.

**Advisory Council of Institutional Leaders (ACIL)** is a new initiative launched in 2022. ACIL is an elite team of institute leaders with two primary goals:

- Advise IUCEE Foundation BOD on various initiatives – current and future.
- Interact amongst themselves and be available, as needed, for consultation.



## Transforming Students

Our basic approach for transforming students is to provide them opportunities to experience projects. These experiences help them develop communication skills, team skills and project management skills. In particular, identifying problems and potential solutions by researching and brainstorming, enhances critical thinking, creative thinking and innovative thinking.



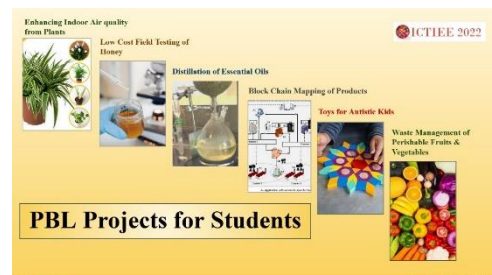
### Courses offered in 2021 were:

- Intro to Sustainability (101 students participated)
- Intro to Entrepreneurship (125 students participated)
- Artificial Intelligence for All (130 students participated)

Courses for students are offered by global experts with assistance of faculty from the same institution, thereby including a faculty empowerment dimension.

### Student Project Competitions conducted in 2021 were

- Generating oxygen from plants for use by COVID patients (45 student teams participated)
- Five Projects identified in collaboration with Indian Micro-Enterprise Development Foundation Projects (IMEDF) (70 teams participated)
- Completion of several Sustainability Projects from 2020 (Implementation plans developed by 21 teams)



Teams are guided with the help of faculty volunteers from IUCEE institutions as well as global volunteers.

### 21 IUCEE Student Chapters were operational in 2021

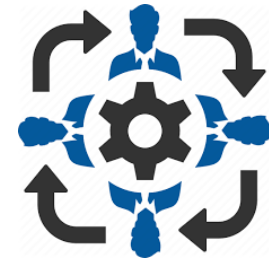
- Student Chapters are initiated and nurtured through the leadership of students who participate in the Courses and Projects during the year. Students identify a faculty mentor and IUCEE provides guidance for operations and management. These Chapters provide excellent opportunities for leadership development.

**National Student Council (NSC)** has emerged from the need for coordination among the Student Chapters. With guidance from IUCEE, student leader conduct regular events and meetings throughout the year.

A **Student Summit** and an **Annual Student Forum** were organized in 2021, entirely by the IUCEE student leader. They provide opportunities for the students to showcase their work, share as well as learn from invited experts in areas of interest to the students.

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## Sharing and Collaborating



### Consortium Colleges

Our 52 Consortium Institutions provide the backbone of our financial sustainability and enable us to offer our various programs.

AISSMS College Of Engineering, MH	MIT Academy Of Engineering, MH
Anurag University, TS	MIT World Peace University, MH
Atria Institute of Technology, KN	Model Institute of Engineering and Technology, JK
B.H. Gardi College of Engineering and Technology, GJ	Nalla Malla Reddy Engineering College, TS
B.M.L. Munjal University, HR	PSG Institutions, TN
B.M.S. College of Engineering, KN	Pune Institute of Computer Technology, MH
Chaithanya Bharath Institute of Technology, TS	R.K. University, GJ
Chitkara University, PJ	Rajarambapu Institute of Technology, MH
DIT University, UK	Ramco Institute of Technology, TN
Gandhi Institute of Technology and Management, AP	RV College of Engineering, KN
Ganpat University, GJ	S.R. University, TS
Hindustan University, TN	Saintgits College of Engineering, KL
Hyderabad Institute of Technology and Management, TS	Saveetha Engineering College
Institute of Aeronautical Engineering, TS	SGT University, HR
JECRC University, RJ	Sree Vidyanikethan Engineering College, AP
K.J Somaiya College of Engineering, MH	Sreyas Institute of Engineering and Technology, TS
K.K.Wagh Inst of Engineering Education & Research, MH	St. Joseph Engineering College, KN
K.L. University, AP	Thiagarajar College of Engineering, TN
Kalasalngam Academy for Research and Education, TN	Vardhaman College of Engineering, TS
KG Reddy College of Engineering and Technology, TS	Vasireddy Venkatadri Institute of Technology, AP
KLE Technological University, KN	Vidyavardhaka College of Engineering, KN
KSRM College of Engineering, AP	Vishwakarma University, MH
M.L.R. Institute of Technology, TS	Visveswaraya Technological University, KN
Malnad College of Engineering, KN	VNR Vignana Jyothi Inst for Engineering and Technology, TS
Marwadi University, GJ	

### Annual International Conference ICTIEE

Our signature annual International Conference on Transformations In Engineering Education was held virtually in 2021 and 2022 after several years at various locations all over India since 2014.

**ICTIEE 2022, from Jan 7,8,9, 2022**, had 763 registered participants in three tracks for leadership, faculty and students. 21 workshops were conducted by global and Indian experts. 8 Panel Sessions with academic leaders of IUCEE



institutions on topics critical to quality of engineering education, were moderated by IUCEE global facilitators. 7 Keynotes addressed were delivered by distinguished speakers from industry and around the world. 78 peer-reviewed papers in engineering education research were presented. 50 of these were published in our Scopus Indexed Journal of Engineering Education Transformations (JEET). Annual Awards were made for outstanding papers, for teaching excellence, student projects and institutional excellence.

**Regional Research Symposium in PBL, RRSPBL**, was held June 18, 19, 2021. IUCEE collaborated with Karnataka State Higher Education Council and Aalborg University. 664 participants had to qualify by taking one of the MOOCs offered by Aalborg University. The Symposium featured 7 workshops by global experts, 5 keynote sessions by global pioneers of PBL and special sessions on Change processes.

#### **Virtual Academy Webinars**

- International Federation of Engineering Education Societies (IFEES), Global Engineering Deans Council (GEDC): 30 webinars (average 100 participants)
- University of Massachusetts Lowell, USA: 15 webinars (average 120 participants)
- Papers from Annual Conference (ICTIEE 2021): 24 webinars (average 30 participants)
- IUCEE Experts: 20 webinars (average 80 participants)

#### **Journal of Engineering Education Transformations (JEET)**

- Scopus Indexed
  - Quarterly Issues (15 papers each)
  - Participated in Regional Engineering Education Symposium (REES 2021)
  - Moved to New Platform
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## Partnering and Connecting



### Programs with Industry

- Automotive Industry Association (AIA)- IIT Delhi: Smart Manufacturing: Webinars (4 webinars, 300 participants), 2 Courses (40 participants), Internships (3 students and 1 faculty)
- Universal Technical Systems (UTS): Initiated E-book Development (with 2 IUCEE institutions)
- GAME-Wadhvani Foundation: Entrepreneurship development (10 institutions, 17 faculty and 70 students)
- MultiCoreware: Faculty Internships (3)

### Corporate Sponsors

- MathWorks: Platinum Sponsor; also hosted Mathematics Symposium with 200 participants in partnership with RV College of Engineering.
- Dassault Systemes: Platinum Sponsor
- COMSOL: Silver Sponsor
- Mentor (Siemens): Silver Sponsor
- Liquid Instruments: Silver Sponsor



### Global Connect

- EPICS (Engineering Projects in Community Service) Purdue University (restarting courses after COVID break)
  - ABET Quality Partner Sponsor (Promoting Outcomes Based Education and Accreditation)
  - IGIP Austria (accreditation of restructured IIEECP Certification)
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## IUCEE FOUNDATION (sec 8) Governance



### Directors:

Krishna Vedula, Ravi Salagame, Sampada Pachaury, Jayant Sathe, Gopalkrishna Joshi

### Advisors:

Uday Desai, Indira Parikh, Manu Vora

### Management Support:

Dilip Chemburkar, Anil Pandit

### Planning and Implementation Support:

Kantha Reddy, Sridhar Nori, Keith Fernandes, Amit Lathigara, Siddharthsinh Jadeja

## IUCEE (USA) 501c3

### Directors:

Krishna Vedula, Sohum Sohoni, Sandeep Shroff, Shanti Subramaniam, Dilip Chemburkar

### Leadership Team



- Section 8 Company, 12A and 80G approvals received
  - Joint Board Meeting held with IUCEE Inc. USA (501c3 Company)
  - All Hands Monthly meetings held for coordinating with experts
  - Signed MOU with Visveswaraya Technological University
  - Individual Membership initiated
  - Volunteer Program initiated
  - MRC (Member Relations Coordinators) Program developed
  - Advisory Council of Institutional Leaders (ACIL) formed
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