

## **IUCEE Quarterly Report** **July to September, 2021**

IUCEE provides a variety of programs as part of the ecosystem for improving the quality of engineering education in India. These programs fall under the Verticals of Faculty, Students and Leadership. These programs are made possible by a network of global experts and with the support of fees from consortium institutions and donations from individuals and corporates.

- **FACULTY COURSES**

### **Project Management FDP for NEP 2020 Implementation**

July 4 to July 31, 2021

Dr. Manu Vora, Business Excellence Inc, USA and Dr. Anil Kumar Agrawal, IIT (BHU), India

<https://iucee.org/wp-content/uploads/2021/05/IUCEE-Project-Management-FDP-5-2021.pdf>

### **Enhancing Clean, Green, and Smart Learning Spaces in & around the Campus**

March 17 to August 10, 2021

Dr. Deepak Waikar, EduEnergy, Singapore, Er. Deepak Gadhia, Sunrise CSP, India, Dr. Ajay Chandak, Solar Cookers International, India and Mr Gaurav Kedia, Indian Biogas Association, INDIA

<https://iucee.org/wp-content/uploads/2021/02/IUCEE-online-I-FDP-Clean-Green-Learning-Spaces-2021-1.pdf>

### **Nurturing Researcher-Pro Mindset in Self**

July 24, 2021 ongoing

Dr. Deepak Waikar, EduEnergy, Singapore

<https://iucee.org/wp-content/uploads/2021/04/IUCEE-EduEnergy-Researcher-Pro-Mindset.pdf>

### **Foundations Course in Research Methods**

Sept 5, 2021 ongoing

Dr. Prathiba Nagabhushan, Australian Catholic University, Australia and Dr. John Tharakan, Howard University, USA

<https://iucee.org/wp-content/uploads/2021/07/IUCEE-Foundation-Course-in-Research-Methods-2021.pdf>

- **EVENTS**

### **Annual Leadership Summit 2021 July 9, 10, 11**

296 leaders from 51 institutions participated actively. 16 of them were at the levels of Vice Chancellors, Directors and Principals. Program included Speakers and Panelists with active discussions with participants.

The overall theme was “**Transform the IUCEE way to NEP and Improved Ranking**”.

- Day 1: Preparing graduates for INDUSTRY 4.0  
Virtual/Augmented Reality, Smart Manufacturing, Expanding Teaching and Research in Emerging Technologies, Preparing for a career in IT
- Day 2: Fostering ENTREPRENEURSHIP in Graduates  
Innovation, Faculty Internships in Industry, Centers for Entrepreneurship, Building Culture of Research and Entrepreneurship

- Day 3: LEADERSHIP for Implementing NEP Guidelines  
Shaping and Aligning Departmental Culture through Leadership, Leadership for NEP 2020, TQM in Education, Challenges Leadership faces in Implementing PBL

Highlights from feedback from participants:

- Most of the sessions were well planned and very informative
- Some sessions were lengthy, repetitive and a little rushed
- Use of technology was excellent.
- Participants be asked to take back some activities and get them done for next session.
- The parallel sessions were hands-on and led to good association with peers
- Need more women leaders and more experienced panel members and policy makers
- Need more industry academia connect and case studies needed
- Getting email ids of participants would be beneficial to continue networking

### **MathWorks Symposium Sept 6,7,8**

“Symposium on Engineering Mathematics with MATLAB” was held virtually on 6<sup>th</sup> to 8<sup>th</sup> Sept 2021. This effort was a true collaboration between MathWorks, IUCEE and RV College of Engineering. More than 200 participants from more than 40 institutions from all over India participated. They acquired new tools and abilities for implementing the NEP 2020 Guidelines, which recommend more project based experiences for educating the future generations of engineers. The Symposium has shown participants how MATLAB handles numerical expressions and mathematical formulas in classroom, which make it an excellent tool for teaching and research. The following sessions were of enormous value to them:

1. Case-study on Engineering Mathematics curriculum of R V College of Engineering
2. Hands-on workshops on teaching Undergraduate Engineering Mathematics courses with MATLAB
3. Ready-to-use demos for their courses
4. Support for integration of these learnings in their own curriculum.

### **Student Summit 2021**

The Slogan of the Student Summit 2021 was **Believe.Belong.Become**

The three-day virtual summit with diverse workshops, Problem based learning activities, and exhilarating sessions along with exciting quizzes was held on **3rd, 4th, 5th September 2021** 04:00 PM to 09:00 PM IST. Details are at: <https://sites.google.com/view/studentsummit21/>

A Team of more than 40 students led by Event Chair Harsh Mishra (BH Gardi) and Co-chairs Harini Mohan & Madhumita (KARE), Preetham & Mohd. Sohel (HITAM), Ritish Hegde (KLE), organized and hosted the Student Summit this year.

The Summit saw exciting sessions in the form of a Design Thinking Quiz Show Kaun Banega Top ka Engineer, Students debating on topics of relevance and current affairs, On the Spot Speaking competition, apart from showcasing 21 Student Chapters and nearly 200 Project Abstract presentations. Alumni Answers and Virtual Open House opened an opportunity for students to ask questions about their career decisions, future plans and personal/professional development from a panel of Experts from Industry, higher education and self-founded entrepreneurs.

The Summit concluded on 5th Sept by felicitating teachers and faculty members from all consortium colleges. A total of 29 awards were announced and 60 certificates of recognitions were given.

### **Engineers Day**

Engineers Day was observed on September 15, with an online meeting and a discussion of the importance of Professional Ethics.

- **WEBINARS**

**GLOBAL**

**IFEES GEDC Webinar July 7: “Future of Computing”**

- Dr.. Wei Zhao, Shenzhen Institute of Advanced Technology, China

**IFEES GEDC Webinar July 14: “Engineering Pedagogy Interplay between Work and Learning Life in Sub-Saharan Africa: Case of Uganda”**

- Vincent Olema, Vocational Education & Training, E-learning

**UML Global Webinar July 15: “E forAll: Turning Dreams into Businesses”**

- Sophan Smith, Executive Director at Entrepreneurship for All (EforAll), Lowell, MA

**IFEES GEDC Webinar July 21 “The Role of Liberal Arts Studies Relative to STEM”**

- Dr. R Natarajan, Former Director IIT Madras.

**IFEES GEDC Webinar July 28 “Understanding Digital Transformation”**

- Mr. Sesha Kishore Kommareddi, CEO of SK Deep Tech

**IFEES GEDC Webinar Aug 11 “The Threat Landscape of Cybersecurity”**

- Shay Zandani, Cyber Security Consultant, New York

**IFEES GEDC Webinar Aug 18 “Strengthening empathy and care in engineering through a global community”**

- David Delaine, Ph.D., Assistant Professor, Department of Engineering Education, The Ohio State University's College of Engineering

**IFEES GEDC Webinar Aug 25 “Consumer Insights inspire Sustainability Innovations”**

- Dr. Emre Oguz, Arçelik Global şirketinde R&D Director

**IFEES GEDC Webinar Sept 8 “Sculpting Accreditation Criteria for Cybersecurity Skills and Knowledge Every Graduate Needs”**

- David Gibson is Professor Emeritus of Computer and Cyber Science at the United States Air Force Academy.

**IUCEE Global Webinar: July 29 “Hands-on teaching of science to orphaned and abandoned children in rural India: Presentation on Balgram”**

- Dr. Beheruz N. Sethna, Retired President University of W. Georgia, USA

**IUCEE Global Webinar: July 12 “Writing research papers on the Scholarship of Teaching and Learning”**

- Dr. Sohum Sohoni, Associate Director, IUCEE, Co-Editor-in-Chief, JEET, Professor, Milwaukee School of Engineering

**IUCEE Global Webinar July 26 “Writing Winning Research Papers”**

- Dr..Veena Kumar, UMD Global

**CONSORTIUM:**

**Virtual Academy July 29 “Orientation On Virtual Labs For Sensors And Measurements”**

- Dr. Ch Renu Madhavi, Associate Professor & HoD in Department of Electronics & Instrumentation Engineering; Mr. Harsha Herle, Assistant Professor, Department of Electronics & Instrumentation Engineering, RV College of Engineering, Bengaluru.

**Virtual Academy July 30: “AI in Engineering Education”**

- Prof. (Dr.) Dattatraya Vishnu Kodavade, Dean, Professor & Head, D.K.T.E.S.T.I., India

**Virtual Academy Aug 25 “COMSOL Multiphysics Software for Research and Project Applications”**

- Dr. Rachana S. Akki, Assistant Professor, Department of Electronics and Instrumentation Technology, RV College of Engineering

### **Virtual Academy Sept 14 “5G Network Slicing”**

- Dr .Vishalakshi Prabhu, Associate Professor, Department of Electronics & Instrumentation Engineering, RV College of Engineering, Bengaluru

### **Virtual Academy Sept 15 “Orientation On “Open Broadcaster Software”(OBS): An ICT Tool”**

- Dr. CH Renu Madhavi, Associate Professor & HoD, Department of Electronics & Instrumentation Engineering, RV College of Engineering, Bengaluru.

### **Virtual Academy Sept 17 “Innovation & Patents”**

- Bindu Sharma, Founder and CEO, Origiin IP Solutions

## **FACULTY SHARING**

Sharing and Collaborating is central to the mission and value system for IUCEE. Monthly meetings for faculty are facilitated by IUCEE advisors.

- Outcomes Based Education (OBE) & Accreditation Cluster ( July 15, Aug 19, Sept 16)
- Teaching and Learning Centers (TLC) Cluster (July 15, Aug 12, Sept 9)
- IUCEE International Engineering Educators Certification ( IIEECP) Cluster (July 20, Aug 17, Sept 21)
- Problem and Project Based Learning (P2BL) Cluster (July 21, Aug 31)
- Interdisciplinary Engineering Cluster (July 3, Aug 28, Sept 24)
- Industry Academy Collaboration (Aug 9) (NEW)

Average 30 participants from about 10 IUCEE institutions participate in each of these cluster meetings.

## **STUDENT PROGRAMS**

### **Student Project: Oxygen Enriched Air from Plants**

(For COVID patients experiencing Pulmonary Distress and for Post Covid convalescence)

#### **Problem Statement**

The challenge is to design a process for producing oxygen using the process of photosynthesis and make it available to patients, particularly those convalescing. Some research has shown that photosynthesis can be optimized and could be looked at as a chemical plant subject to the same chemical processes as any other. Even if the device can produce limited amounts it may be useful for providing temporary relief in emergency cases

The teams were given 1 month to think of possible solutions and prepare a 5 minute video explaining their approach and idea. Out of the 100+ teams that applied to participate in the competition, 66 teams submitted their ideas successfully. 4 best scoring ideas were given prize money as a recognition of their proof of concept or model developed. Students applied their design thinking to come up with various ways to increase oxygen production using aquatic plants, types of algae and, selective land plants

### **Student Projects Oriented for Problem Based Learning (POPBL-2021)**

Starting August 2021, 5 Projects were announced which were defined around real world problem solving. The aim is for students to undergo a PBL process while coming up with realistic solutions and ideas. A total of 250+ student teams applied for these projects. 200+ teams submitted their preliminary understanding of the problem statements and presented their Abstracts during the Student Summit. The teams are guided by their Faculty guides and several experts from IUCEE to arrive at feasible solution/s. These teams are given mentoring sessions and are expected to submit a Paper on 15th November. Shortlisted Papers will be invited to present at the Annual Student Forum and may find a place in JEET.

### **Project Definitions**

IUCEE Foundation Student Development Programs brings a unique opportunity to its students to get involved in doing engineering projects inspired by real time challenges faced by local and regional industries in crafts and agro space.

- **Project Honey**  
Develop an On-Field Low-Cost Testing Kit that can provide an equivalent substitute to lab testing or a preliminary rapid checking of quality standards before the samples are sent to Lab testing.
- **Project Essential Oil**  
Propose (more than one) ways to improve the efficiency of the essential Oil Distillation process by <0.6 %. General productivity standard for oil recovery is 0.6%, although it can up to 1.2%. Sun drying, Fuel quality and time of harvesting are some of the factors impacting the efficiency of the oil extraction.
- **Project Toy for Autism**  
Design a Toy or a Game that can help improve the concentration ability and provide stimulation to an autistic child less than 16 years old. The design can be designed to suit a smaller age range anywhere between 2 years to 16 years. It could be a single or a multi-player toy that can help an autistic kid to deal with their weakness and/or improve their cognition within the spectrum of a normal child.
- **Project Fresh produce**  
Identify ethical and environmentally sustainable solutions to prolong shelf-life of fresh produce, organic methods to utilise the excessive produce and also ways to manage the waste produced due to transfer and storage
- **Project Blockchain mapping**  
To establish tracking and database management from origin to end-user. Bring source of origin, material, procurements, supplies, personnel on App with geo-tagging, block chain or, other tools

### **Student Chapter Monthly Meets**

The Student members of 21 Student chapters of IUCEE meet on the 3rd Saturday of every month along with their Faculty Advisors at 7PM to learn and share best practices and collaborate for smarter and more engaging experiences among them.

The Sept 18th Monthly meeting had an agenda to understand the success and failures of Student Summit held on 3rd-5th Sept. While the individual session saw intense engagement from the students, the overall representation of students from various chapters was low. The sub teams in break out rooms provided some clear insight into the participation. Online sessions overdose and academic pressures of other assignments and exams were major reasons followed by the duration and length of the Summit. The trend indicates that smaller events scattered throughout the year in smaller teams may be the new way forward.

### **IN THE WORKS**

#### **IUCEE NEP Pilot**

IUCEE has taken the initiative to assist its Consortium institutions in the implementation of some of the guidelines of National Education Policy 2020. The focus is on “Holistic and Multidisciplinary” education. Since November 2020, several IUCEE institutions started working together to plan and implement a Pilot in the academic year 2021-22.

The Pilot will consist of selected first year students from each institution. Selected faculty from these institutions were provided guidance in how to teach in a more student centric method, using case and real world examples in their first years courses, particularly in mathematics, physics, chemistry, graphics and programming.

In addition, the first year students in the pilot will be offered several mini courses by international experts and assisted by faculty from the institutions. Minicourses will be on:

- Artificial Intelligence for All
- Student Leadership
- Design Thinking
- Social Emotional Learning
- Clean and Green Campus
- Entrepreneurial Thinking

These courses will include students working on projects in order to experience holistic and multidisciplinary thinking.

### **Annual Conference ICTIEE 2022**

The Ninth International Conference on Transformations In Engineering Education (ICTIEE 2022) (<https://ictiee.org/ictiee2022/>) is planned to be held virtually on Jan 7 to 9, 2022. (<https://ictiee.org/ictiee2022/>). Our IUCEE Technical Staff has now become very effective in conducting virtual events.

ICTIEE is one of the signature programs of IUCEE connecting education experts and passionate educators all over the world for improving the potential for excellence in engineering education. It has emerged as a global platform for sharing best practices and collaborating with academic and industrial experts for both faculty and students. In line with the previous ICTIEE conferences, ICTIEE 2022, hosted virtually, features paper and poster presentation sessions, workshops, special lectures, panel discussions, conclaves and thus facilitating global network for the cause of effective engineering education.

ICTIEE 2022 is expected to have more than 1000 delegates and is welcoming passionate educators and students to be a part of this mega event.

The research articles submitted to ICTIEE are continuously increasing every year in terms of quality and quantity. 160 papers on engineering education have been received and are under review. Selected papers from these will be the core of the program and presented in two parallel tracks.

A Steering Committee representing the Consortium institutions and advised by global experts has started the detailed planning of the workshops, keynote as well as panel sessions. The conference is expected to attract over 1000 participants and is planned to be very interactive.

The Annual Student Forum will be held in parallel.

### **IUCEE FOUNDATION MANAGEMENT**

The Management of our Sec 8 Company (formed in December 2020) ensures timely and effective meetings of the IUCEE team of Global esports to ensure proper communications and decision making: ALL HANDS Monthly Meeting (July 3, Aug 14)

The Management also ensures compliance with all requirements of the Sec 8 Company. A Board Meeting of the FOUNDATION was conducted on Sept 15.