IUCEE International Engineering Educator Certification Program (IIEECP)

With more than 4,000 engineering colleges, many of them having started in the past two decades, the engineering education system in India faces a major challenge in providing quality education to the large numbers of potential engineering graduates. IUCEE (Indo Universal Collaboration for Engineering Education), founded in 2007, has been offering a wide range of faculty development programs to faculty from over 200 of these colleges, during the past several years with the help of over 200 international academic and industry experts. The assessment of these programs has revealed the need for rigorous training in the skill of effective teaching in engineering for the vast majority of faculty in these colleges.

Inspired by the Effective Teaching workshops offered by Dr. Richard Felder and Dr. Rebecca Brent of the USA as well as the Teacher Certification Course of IGIP (International Society for Engineering Pedagogy) Austria, IUCEE has designed a certification program. This IUCEE International Engineering Educators Certification Program (IIEECP) is offered in a blended format, including face-to-face sessions, as well as asynchronous on-line modules coupled with regular synchronous on-line sessions. It has been piloted with partial support from Microsoft in 2015-16 and is now offered for a fee to cover expenses. It addresses the need for teaching skills and the certification of teaching skills. CII (Confederation of Indian Industries) has also endorsed this program as part of the CII Higher Education Mentorship Program: [http://www.ciihighereducation.in/mentoring-programmes.php](http://www.ciihighereducation.in/mentoring-programmes.php).

**Program Objectives**

- To apply the theoretical components of teaching and learning to a specific course and practice to better manage all important aspects related to the instructor, the students and the course materials
- To implement effective teaching strategies resulting from improving rapport with students developed through an appreciation of the learning needs and learning styles of millennial learners
- To manage student motivation and attention span, thereby impacting personal teaching style and professional confidence
- To better plan course content and delivery resulting from a better understanding of course design principles
- To formulate course objectives based on understanding and applying Blooms Taxonomy, and relate these to program outcomes
- To create a dynamic classroom using the variety of active learning strategies learnt and practiced
- To improve the quality of tests and quizzes substantially based on a deeper awareness of effective assessment principles and practices
- To create rubrics for refining evaluation process based on improved understanding of the pedagogical process
- To implement collaborative learning in order to develop real world professional skills and to build interpersonal team skills of students
- To plan for and practice harnessing technology for more effective teaching with techniques such as the flipped classroom and blended teaching

**Program offered in 2015-18**

The first national pilot was concluded on June 17, 2015, with 29 participants from IUCEE Consortium colleges completing satisfactorily. A second national pilot (35 participants) and the first institutional pilot (39 participants all from same institution) concluded in May 2016. The experience gained from these pilots has enabled the offering of IIEECP Program in a modified format in 2016-2017, in an effort to scale it and make it financially sustainable. During 2016-18, IIEECP Certification has been completed by 263 additional faculty (making a total of 366 faculty certified since the start of the program) and over 100 more faculty are close to completion by June 2019.
2018-19 IIEECP Program Curriculum

The Complete Program is offered in three Phases:

Phase I – PRE-CERTIFICATION WORKSHOP
This is a three-day hands-on face-to-face workshop by global experts in engineering education and is designed to enable the participants to begin to understand the principles of learner-centered teaching; to design or redesign a course and its elements, emphasizing learning outcomes; to develop different teaching and active learning strategies for implementation of these elements; to design formative and summative assessment tools and rubrics for outcomes assessment.

Phase II - ON-LINE MODULES
This component is delivered completely on-line over a period of 12 weeks and consists of 6 modules. An e-platform is used for delivering course content along with assignments and discussions. This asynchronous format is supplemented by synchronous on-line meetings of all participants and concerned faculty, once a week. The trainees attend this phase while teaching at least one course and complete their practicum by implementing strategies learned in their respective classes, recording outcomes and preparing a personal teaching portfolio.

The following six modules are taught in Phase II by expert faculty from the USA and India.

MODULE 1:  Principles of Effective Learner-Centred Teaching
MODULE 2:     Planning and Designing / Redesigning a Course
MODULE 3:     Creating an Active and Dynamic Classroom
MODULE 4:  Fostering Collaborative Learning
MODULE 5:  Harnessing the Power of Technology
MODULE 6:  Effective Assessment of Learning Outcomes

Phase III – VALEDICTORY WORKSHOP
Participants who have completed Phase I and II make on-line presentations in Phase III, based on their Teaching Portfolio and a one year plan of action for teaching/research and professional development.

Program Delivery, Schedule and Fees

The Phase I Pre-Certification Workshops are conducted multiple times during the year at different locations all over India. Institutions may request to host Phase I workshops by a guarantee of a minimum of 25 participants.

Participants completing Phase I Pre-Certification Workshop satisfactorily are recognized as Pre-Certified for the IIEECP Certification. This serves as a beginning of transformation in their individual teaching abilities as well as their contribution to Outcomes Based Education. Participants who are Pre-Certified are encouraged to follow up with Phase II and III in order to obtain the IIEECP Certification at their convenience.

The fees charged for each of these Phases are (effective Jan 2018):

Phase I:  Rs. 4,900 for IUCEE Consortium members; Rs. 6,900 for non members
Phase II:  Rs. 7,000 for IUCEE Consortium members; Rs. 10,000 for non members
Phase III: Rs. 4,900 for IUCEE Consortium members; Rs. 6,900 for non members

Program Coordination

The IIEECP program is designed and coordinated by Dr. Veena Kumar, Director of IIEECP and active member of the Board of IUCEE. She is a professor at the University of Maryland University College and was earlier professor and chair, education technology, IIT Delhi. An experienced educator, she has vast experience in curriculum development, on-line instruction and teacher training in France, India and USA.

Dr. Krishna Vedula, Executive Director, IUCEE and Professor at University of Massachusetts, who co-founded IUCEE in 2007, oversees the Program.
Faculty

Dr. Krishna Vedula
University of Massachusetts Lowell, USA

Dr. Veena Kumar
University of Maryland University College, USA

Dr. Rajan Subramaniam
Arizona State University, USA

Dr. Stephanie Farrell
Rowan University, USA

Dr. Archana Mantri
Chitkara University, India

Dr. Claire Komives
San Jose State University, USA

Dr. Neeraj Buch
Michigan State University, USA

Dr. Rio D’Souza
Principal. St. Joseph Engineering College

Dr. Sohum Sohoni
Arizona State University, USA

Dr. Prathiba Nagabhushan
Australian Catholic University, Australia

Dr. Anil Kulkarni
Penn State University, USA

Mr. Tom Iwinski
Penn State University, USA

Krishna Vedula: Krishna_Vedula@uml.edu
Executive Director, Indo Universal Collaboration for Engineering Education
IUCCE: https://iucee.org/