

IUCEE MISSION NEP 2021

PBL is the foundation for implementing the NEP Guidelines of “Holistic and Multidisciplinary Education”. This transformation has to start with first year engineering students. IUCEE Mission NEP is offering an opportunity to all IUCEE Consortium institutions (with membership fees paid up to date) to be part of our First Year Pilot in implementing NEP guidelines as part of their consortium membership benefits.

We had started preparation IUCEE NEP 2020 Pilot from November 2020. We had several meetings with Mr. Sharad Marathe of UTS and leaders of IUCEE institutions.

1. We decided to focus the Pilot on First Year Students entering in Semester 1 of 2021-22.
2. We decided to focus on how we teach using student centred teaching, case studies, real world examples and project/problem based learning
3. 16 IUCEE member institutions were eager to be part of this Pilot;
4. They identified faculty teaching FY students and we had several sessions with them.
5. We identified 6 mini courses to be taken by the selected Pilot Batch of FY students.
6. IUCEE Experts agreed to teach these courses,
7. 28 more IUCEE colleges showed interest in being part of piloting the 6 Mini Courses to a selected number of their FY students.
8. Faculty from all 44 IUCEE colleges were recruited to mentor the first year students during these courses.
9. Faculty Empowerment Programs were conducted through a series of webinars in June for FY Faculty as well as Faculty mentors of Mini Courses.
10. A Mini Symposium was held on July to ensure that everyone understood the plan.

Due to COVID, FY admissions were delayed at all colleges. Hence, we had a quiet period for a few months.

Now the pace picks up again. All colleges will have their first year students admitted by November.

11. We are, therefore, planning the 6 minicourses as per schedule below.
12. We will have preparatory meetings in November and December to finalize the participating students and faculty mentors.

Below is brief description of the 6 mini courses for our IUCEE Mission NEP.

1. Leadership and Sustainability

The objective is to have students work in teams and develop leadership skills while addressing a real world problem relevant to a sustainability theme. Students develop lifelong learning skills when they do research on different sustainability themes with guidance by experts. Students appreciate the multidisciplinary dimensions of these problems as well as the need for clarity in basic concepts of mathematics and science. Defining a specific problem and working in teams to develop and, if possible, implement a possible solution to the problem, will enhance their professional skills. Following sessions will be offered by global experts in the form of webinars. Students will work in teams and participate in discussions and assignments on an online platform (Canvas). Assistant faculty will guide, mentor and assess the work by the students.

- NAE Grand Challenges and UN Sustainability Goals
- Affordable Housing: Dr. S.D. Rajan, Arizona State University
- Clean Water: Dr. Raj Rajaram, Clean Water, Chicago
- Sustainable Energy: Dr. Agami Reddy, Sustainable Energy, Arizona State University

- Waste Management: Dr. Prakasam Tata, Waste Management, Chicago
- Education Augmentation: Dr. Aditya Bhatnagar, Education Augmentation, Chandigarh
- Select one theme, identify specific problem in a community
- Explore potential solutions and select most promising

2. Clean and Green Campus

This course is similar to the Leadership and Sustainability Course but with emphasis on projects relevant to making the Campus Clean and Green. Students work in teams and develop professional and problem solving skills while addressing a specific aspect of improving the Clean and Green dimension of their campus. Students develop lifelong learning skills when they do research on different themes with guidance by experts. Students appreciate the multidisciplinary dimensions of these problems as well as the need for clarity in basic concepts of mathematics and science. Following sessions will be offered by global experts in the form of webinars. Students will work in teams and participate in discussions and assignments on an online platform (Canvas). Assistant faculty will guide, mentor and assess the work by the students.

- Introduction to Clean and Green : Mr. Deepak Gadhia, Chairman at Sunrise CSP India Pvt. Ltd
- Renewable Energy: Dr. Deepak Waikar, Tacstra Solutions Pte Ltd, Singapore, Managing Partner for EduEnergy Singapore
- Waste Management: Dr. Gaurav Kedia, Chairman, India Biogas Association
- Energy Basics, Energy Conservation : Dr. Ajay Chandak, Certified Energy Auditor & Renewable Energy Expert

3. Artificial Intelligence for All:

The objective of this course is to introduce the students to a tool and methodology which is expected to dominate their professional careers, whatever discipline they may be in. The webinars give an introduction to Artificial Intelligence, exploring the various facets of AI and its impact on modern life, and also talk about some problem-solving techniques. This will nurture the creative and problem solving abilities of the students. The list of topics covered are:

- Pictorial Intro to AI and the AI Eco System;
- Intelligence from Data and Search Engines;
- Excel Tutorial and Clustering with Excel;
- Perceptron and Excel;
- Use Cases in Machine Learning;
- Building Intelligent Machines and Deep Learning

The course is taught by Prof. Vemuri Rao (UC Davis, Retired)

4. Introduction to Entrepreneurial Thinking

The objective of this course is to promote an entrepreneurship mindset and to mentor students (along with faculty) in using a “Lean Launchpad” method and customer discovery process. Teams of faculty and students will go through this Course and learn the process of entrepreneurship.

0. Entrepreneurial Mindset (are you an entrepreneur ? ..exercises)
1. Pitch an idea – Identify the problem to be solved
2. Circular Design thinking
3. Understanding how to get effective customer feedback (using Lean Launchpad method)

4. Iterate using lean startup
5. Create the minimum value product (MVP) and prototype
6. Create the Business Model Canvas
7. Start selling the idea and negotiation exercises

The course is taught by Prof Shalini Gopalakrishnan (Entrepreneur, USA) and Professor Ranji Vaidyanathan (Oklahoma State University).

5. Design Thinking and Community-Based Design

This course builds on several years partnership between IUCEE and EPICS at Purdue University, USA. Design thinking as part of EPICS is focused on identifying community needs and finding solutions to problems associated with these needs. Following topics will be covered with teams of students and faculty identifying community partners and problems.

1. Introduction to Design Thinking
2. Case study for design thinking success
3. Users and community partners
4. Prototyping: Requirements and specifications
5. Ideation and concept generation
6. Teaming concepts in design
7. Testing and design to prevent failures
8. Detailed design and delivery

This course is taught by Dr. William (Bill) Oakes, Director of the EPICS Program, Professor of Engineering Education at Purdue University, and a registered professional engineer.

6. Social Emotional Learning

This course will provide participants with the fundamental knowledge of Social and Emotional Learning (SEL), a process through which individuals acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions. Social and emotional skills are critical to being a good student, citizen, and worker, and many risky behaviors (e.g., drug use, violence, bullying, and dropping out) can be prevented or reduced when integrated efforts are used to develop students' social and emotional skills.

This course is designed to accomplish the following goals:

- To familiarize the students to social emotional learning
- To enable the students to make responsible decisions, as good students and citizens based on social emotional learning principles.

Course will be taught by Dr. Prathiba Nagabhushan of Australian Catholic University.

NEP Pilot : Six Mini Courses Tentative Schedule

Course	Community Projects using Design Thinking	Clean and Green Campus	Entrepreneurial Thinking	Social Emotional Learning	Artificial Intelligence for All	Leadership and Sustainability
Mon Jan 10	4:30 pm (WO)					
Tue Jan 11		7:00 pm (DW)				

Wed Jan 12			8:00 pm (RV)			
Mon Jan 17				4:00 pm(PN)		
Tue Jan 18					8:00 pm (VR)	
Wed Jan 19						8:00 pm (SDR)
Mon Jan 24	4:30 pm (WO)					
Tue Jan 25		7:00 pm (DW)				
Wed Jan 26			Republic Day			
Mon Jan 31				4:00 pm(PN)		
Tue Feb 1					8:00 pm (VR)	
Wed Feb 2						8:00 pm (SDR)
Mon Feb 7	4:30 pm (WO)					
Tue Feb 8		7:00 pm (DG)				
Wed Feb 9			8:00 pm (SG)			
Mon Feb 14				4:00 pm(PN)		
Tue Feb 15					8:00 pm (VR)	
Wed Feb 16						8:00 pm (AR)
Mon Feb 21	4:30 pm (WO)					
Tue Feb 22		7:00 pm (DG)				
Wed Feb 23			8:00 pm (RV)			
Mon Feb 28				4:00 pm(PN)		
Tue Mar 1					Shivratri	
Wed Mar 2						8:00 pm (AR)
Mon Mar 7	4:30 pm (WO)					
Tue Mar 8		7:00 pm (AC)				
Wed Mar 9			8:00 pm (SG)			
Mon Mar 14				4:00 pm(PN)		
Tue Mar 15					8:00 pm (VR)	
Wed Mar 16						8:00 pm (RR)
Mon Mar 21	4:30 pm (WO)					
Tue Mar 22		7:00 pm (AC)				
Wed Mar 23			8:00 pm (RV)			
Mon Mar 28				4:00 pm(KV)		
Tue Mar 29					8:00 pm (VR)	
Wed Mar 30						8:00 pm (RR)
Mon Apr 4	4:30 pm (AB)					
Tue Apr 5		7:00 pm (GK)				
Wed Apr 6			8:00 pm (SG)			
Mon Apr 11				4:00 pm(KV)		
Tue Apr 12					8:00 pm (VR)	
Wed Apr 13						8:00 pm (PT)
Mon Apr 18	4:30 pm (AB)					
Tue Apr 19		7:00 pm (GK)				
Wed Apr 20			8:00 pm (RV))			
Mon Apr 25				4:00 pm(KV)		
Tue Apr 26					8:00 pm (VR)	

