



## UNESCO CHAIR ON ENGINEERING EDUCATION PROGRESS REPORT

- **Title of the Chair/network:** UNESCO Chair on Engineering Education, UCEE ([www.ucee.ut.ac.ir](http://www.ucee.ut.ac.ir))
- **Host Institution:** University of Tehran, Iran, [www.ut.ac.ir](http://www.ut.ac.ir)
- **Date of establishment of the chair/ network:** April 26, 2014
- **Period of activity under report:** April 2018-April 2019
- **Report established by:** Hossein Memarian UNESCO Chair holder for Engineering Education, and Professor of Geo-engineering, University of Tehran, (<https://profile.ut.ac.ir/en/~memarian>, <https://mine.ut.ac.ir/en/~memarian>)

### 1. Executive Summary:

The primary initiative in launching UNESCO Chair on Engineering Education (UCEE) was started in 2010. This Chair was founded officially on April 26, 2014 in a ceremony in the presence of **Ms. Irina Bokova** UNESCO Director General, as well as the president of the University of Tehran. The first annual report of the chair was presented on May 2015. This report covers the activity of the chair for the period of **26 April 2018 to 26 April 2019**. The main activities and research projects performed in the mentioned period can be summarized as follows:

**Educational design:** Designing new courses and educational programs for engineering education.

**Educational Training:** Holding diverse educational workshops for the professional development of faculty members and teaching assistants (TAs)

**Lecture:** Oral presentations in different universities and professional centers, in various areas of engineering

**Research:** Conducting diverse research projects on different areas of engineering education.

**Publications:** Publishing new book and research articles in engineering education.

**Contribution:** Active member of:

- The board of Iran Society of Engineering Education (ISEE),
- Iran Accreditation Institute for Engineering Education (IAIEE),
- Center for the Quality Assessment of College of Engineering of University of Tehran,
- Engineering Branch of Academy of Sciences of Iran,
- ISEE's branch in University of Tehran.

**Cooperation:** National and international relations with signing memorandum of understandings (MOU's) for joint cooperation with universities, societies and related organizations and associations.

## **2) Activities:**

### **a) Education/Training/Research**

#### **i. Education (leading to certificate)**

– Design and implementation of a new graduate program “Masters of Engineering Education” which is the first of its kind in Iran. It will officially be started in September 2019 at University of Tehran.

– Designing and implementing series of workshops for professional development of faculty members and teaching-learning skills of teaching assistants (TAs) concerning following purposes:

1. Preparing educational objectives
2. Teaching and learning styles
3. Active learning
4. Learning Assessment
5. Assessment by rubrics
6. Teaching experiences
7. Teaching assistants (TA) training
8. Accreditation of engineering programs
9. Standard engineering education
10. Deficiencies of Iran engineering education
11. Teaching engineering design
12. Academic ethics
13. Role of advisors in engineering education
14. Preparing educational materials
15. Promoting students motivation to learning
16. Online engineering education
17. Innovation in Teaching & Learning (New)
18. External assessment of engineering programs (New)

At the end of each workshop, a certificate is granted to participants.

#### **ii. Training (short term)**

During the report period, several workshops are presented for the professional development of faculty members and training of teaching assistants (TAs). These workshops are presented in conjunction with the Centre for Quality Assurance of the College of

Engineering, University of Tehran and ISEE's branches in some universities:

- 4 days educational course of “professional development”, for faculty members of the College of Engineering and members of some other universities, University of Tehran (June 23-26, 2018).



Four days faculty development educational course, June 2018

- TA training (or successful teaching assistantship), for teaching assistants of the College of Engineering, University of Tehran (February 27, 2019 & October 25, 2018).



TA training workshop, October 25, 2018



TA training workshop, February 27, 2019

- Being prepared for an External Assessment, for the members of Internal Assessment Groups, in KNTU University (November 17, 2018).
- Educational Course on “How to conduct a workshop on developing the skills of teacher assistants (TAs)”, for volunteers from faculty members of some universities at University of Tehran (April 24, 2019)
- A new postgraduate course entitled “Engineering Education” designed by the chair and presented by the chair-holder. This graduate course was offered for the first in September 2018.

### iii. Research

Several research projects were carried out by the chair during the report period. The results of these researches were presented to the chair's steering committee. The 19 members of this committee represent different fields of engineering at the College of Engineering of the University of Tehran. Steering committee approved the results of the following research projects during its monthly meetings. Most of these approvals are implemented at the College of Engineering of the University of Tehran and also are posted on the website of the chair to be used by other universities. The title of some other researches carried out by the chair during the report period are:

1. History of Accreditation of Engineering Education programs in Iran
2. Investigating the causes of engineering students' lack of motivation

3. Challenges of Evaluating the Performance of Engineering Faculty Members
4. Establishment of the Office of Ombudsman in Iran's higher education centers.
5. Challenges of Industry-University Collaboration
6. Managing flipped learning Classroom

## b) Conferences/Meetings

### c) Interuniversity Exchange/Partnerships

- As a keynote Speaker, the Chair-holder gave a lecture on Challenges of Industry-University Collaborations, in the 3<sup>rd</sup> National Conference on Petroleum Geo-mechanics (22 January, 2019).



22 January, 2019

- The Chair-holder was invited as guest speaker to the roundtable meeting on lessons learned from the experiences of engineering education accreditation: Establishing the Iran Accreditation Institute for Engineering Education (IAIEE), in the 1<sup>st</sup> International Conference and 12<sup>th</sup> National Conference of Quality Assessment in University Systems (22 January, 2019)



22 January, 2019

- The Chair-holder gave a lecture on Innovation in Teaching-Learning Processes: Experiences of Engineering Education in Iran, in the 3<sup>rd</sup> National Conference on Higher Education in Iran (13 May, 2018)
- The Chair-holder gave a lecture on "Engineering Education: Today and Tomorrow", in Sharif University of Technology, Tehran, Iran (5 May, 2018).



5May, 2018 meeting

- The Chair-holder was invited as guest speaker to the roundtable meeting on Necessity and Methodology of development in curriculum of undergraduate Chemical Engineering, in Amir-Kabir University, Tehran, Iran (21 January,2019).



21 January 2019 meeting

#### **d) Publications**

##### **Multimedia Materials**

- Updating and maintaining the bilingual website of the UNESCO Chair on Engineering Education ([ucee.ut.ac.ir](http://ucee.ut.ac.ir))
- Promotion of UCEE activities via Newsletters, the 4th electronic newsletter, Mar 2019

##### **e) Cooperation with UNESCO Headquarters, Field Offices**

- Active collaboration and participating in meetings and activities of UNESCO National Commission.

##### **Future Plans and Development Prospects**

- Cooperation with universities and related centers to expand the process of accreditation of engineering education programs.
- Supporting research projects on challenges of engineering education.
- Defining annual prizes for the best research projects on engineering education.
- Holding training courses and workshops for professional development of faculty members and teaching assistants (TA).

- Promoting the process of retraining engineers employed in industry and seeking industry collaboration to promote the professional engineer (PE) program in the country.
- Designing and implementing educational courses, including master’s degree program in engineering education.
- Presenting educational and research advice and services to universities, organizations and industry.
- Expanding the activities of the chair to the neighboring countries and others in the region, with the aim of establishing the “Regional Center for Engineering Education”.
- Establishing links with related centers at international level and other UNESCO chairs, in order to exchange the findings.
- Planning to join the world conventions in the area of engineering education (e.g. Washington Accord).

## **Appendix**

### **1) Human Resources**

The chair structure consists of steering Committee, board of advisors and the office of the chair holder.

**Strategic Council:** The role of strategic council is to propose the general guidelines and monitor the macro policy of the chair. The 19 members of this council (14 full professors) represent different fields of engineering at the College of Engineering, University of Tehran.

**Advisory Board:** The purpose of advisory board is to gain consultation in the area of macro engineering education and to establish links between UNESCO Chair on Engineering Education and other related centers at national, regional and international levels. The members of the advisory board are pioneer professors in the fields of engineering and pedagogy and experts from industry.

**Chair office:** Technical staff and secretary.

### **2) Financial Resources**

Financial contribution and specify the amount in U.S. dollars

- Host Institution: \$25000
- NGO: \$5000

### **Space**

A 120 square meter office, with three personnel

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