



## PROGRESS REPORT

- **Title of the chair:** UNESCO Chair on Engineering Education (UCEE), [www.ucee.ac.ir](http://www.ucee.ac.ir), [ucee@ut.ac.ir](mailto:ucee@ut.ac.ir)
- **Host Institution:** University of Tehran, [www.ut.ac.ir](http://www.ut.ac.ir)
- **Date of formal establishment of the chair:** 26 April 2014
- **Period of activity under report:** April 2016 to April 2017
- **Report established by:** Hossein Memarian UNESCO Chairholder for Engineering Education, and Professor of Geo-engineering, University of Tehran, <https://rtis2.ut.ac.ir/cv/memarian/?lang=en-gb>

### 1. Executive Summary

The primary initiative in launching UNESCO Chair on Engineering Education 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. Present report covers the activity of the chair for the period of April 2016 to April 2017. The main activities and research projects performed in the mentioned period can be summarized as follows:

- **Accreditation:** Publishing guidelines and offering advice for internal assessment of engineering programs of different universities.
- **Research:** Conducting diverse research projects on different areas of engineering education.
- **Educational design:** Designing new courses and educational programs for engineering education.
- **Publications:** Publishing research articles in different areas of engineering education.
- **Lectures:** Oral presentations in different universities and professional centers, in various areas of engineering education.
- **Training:** Holding diverse educational workshops for the professional development of faculty members and teaching assistants.
- **Contribution:** Active member of the boards of directors 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 and Engineering Branch of Academy of Sciences of Iran.
- **Cooperation:** National and international relations with signing memorandum of

understandings (MOU's)) for joint cooperation with universities, societies and related organizations and associations.

- **Establishment:** Designing and maintaining the bilingual website of the UNESCO Chair on Engineering Education ([ucee.ut.ac.ir](http://ucee.ut.ac.ir)) and publication of the chair's E-Newsletter.

More details of the chair activities can be found below and in our bilingual website ([ucee.ut.ac.ir](http://ucee.ut.ac.ir)).

## ۲. Activities

### a) Education/Training/Research

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

- Designing a new graduate program "Masters of Engineering Education". This program which is the first of its kind in Iran, was approved by the steering committee of the chair (February 17, 2016) and forwarded to the University of Tehran for further actions.
- Designing a series of workshops for professional development of faculty members and teaching-learning skills of teaching assistants (TA):
  ۱. Preparing educational objectives
  ۲. Teaching and learning styles
  ۳. Active learning
  ۴. Learning Assessment
  ۵. Assessment by rubrics
  ۶. Teaching experiences
  ۷. TA training
  ۸. Accreditation of engineering programs
  ۹. Standard engineering education
  ۱۰. Deficiencies of Iran engineering education
  ۱۱. Teaching engineering design
  ۱۲. Academic ethics
  ۱۳. Role of advisors in engineering education
  ۱۴. Preparing educational materials
  ۱۵. Capable engineering graduates

#### ii. Training (short term)

During the report period, several workshops are presented for the professional development of faculty members and training of teaching assistants (TA). These workshops are presented in conjunction with the Centre for Quality Assurance of the College of Engineering, University of Tehran and Iran Society of Engineering Education (ISEE). At the end of each workshop, a certificate is granted to participants.

١. **Learning assessment** (or measuring learning outcomes), for faculty members of the KNT University of Technology (June 1, 2016)
٢. **TA training (or successful teaching assistantship)**, for teaching assistants of the College of Engineering, University of Tehran (October 27, 2016)
٣. **TA training (or successful teaching assistantship)**, for teaching assistants of the KNT University of Technology (November 12, 2016)
٤. **Preparing educational objectives**, for faculty members of the KNT University of Technology (November 23, 2016)
٥. **Learning assessment** (or measuring learning outcomes), for faculty members of the KNT, University of Technology (January 4, 2017)
٦. **Successful teaching assistantship (TA)**, for teaching assistants of the College of Engineering, University of Tehran (February 20, 2017)
٧. **Internationalization of engineering programs**, for managers and representatives of College of Sciences, University of Isfahan (February 22, 2017)



2016/10/27

2017/02/20

Selected workshops for teaching assistants



2016/11/23



2017/01/04

Selected workshops for faculty development

### 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, University of Tehran. Steering Committee approved the following research projects during its monthly meetings. Most of these approvals are implemented at the College of Engineering of University of Tehran and also are posted on the website of the chair to be used by other universities.

- Preparing a document for “promoting international cooperation in engineering education” as a part of Iran education 2030 document, according to the UNESCO Education 2030 Incheon Declaration. This document was published by IRUNESCO.
- Designing a new “Master of Engineering Education program” for Iran higher education system (February 17, 2016).
- The role of published research papers in promotion of faculty members
- Comprehensive program for professional development of faculty members of engineering schools.
- Designing a new postgraduate course entitled “Engineering Education”. This course will be offered by the chairholder, for the first time on September 2017.

### **Educational Recommendation**

One of the goals of UNESCO chair on engineering education is to observe new findings and innovations in different aspects of engineering education; and sharing them with academic members and other beneficiaries. This is in line with one of the main fields of research in UNESCO chair, i.e. recognizing current challenges of engineering education in Iran. The results of these researches have been reviewed by the steering committee of the chair and posted on the chair’s website. Attached with each educational suggestion is normally a document or a research paper on the subject, prepared by the chairholder.

The title of recent engineering suggestions are:

- Promoting futures studies in engineering education
- Needs for innovation in engineering education
- Quality control of engineering education
- Designing new course “introduction to engineering”
- Revising capstone course or BSc engineering project

### **b) Conferences/Meetings**

#### **i. Key Conferences and Workshops hosted by the Chair**

##### **1. Educational week, on development of learning-teaching skills of Afghan faculty members**

UNESCO chair on Engineering Education has held an educational week on the development of learning-teaching skills of Afghan faculty members from August 27<sup>th</sup> to August 31<sup>st</sup> 2016, at the school of Mining Engineering, College of Engineering,

University of Tehran. These workshops presented by the chairholder, professor Hossein Memarian. The topics of each day workshops were: preparing educational objectives, teaching-learning styles, assessment of learning outcomes, teaching experiences, and quality control of educational programs. The educational week has scheduled to train 25 Afghan faculty members from geology and mining departments of Kabul University, Kaboul Polytechnic and Balkh University.



**Educational week, on development of learning-teaching skills (27-31 Aug 2016)**

## **2. Advisory Board Seminar**

A half a day seminar on “engineering education in Iran” was held (November 16, 2016). The seminar was attended by members of the advisory board of the chair to gain consultation in the area of macro engineering education and to establish links between the chair and other related centers. The members of the advisory board are pioneer professors in the fields of engineering and pedagogy and experts from industry. The representatives from the following organizations attended this meeting.

- General Secretary of the UNESCO National Commission
- Engineering branch of Academy of Science of Iran
- Iran Society of Engineering Education (ISEE)
- Iran Accreditation Institute for Engineering Education (IAIEE)
- Mining Engineering Organization of Iran
- Ministry of Road, Housing and Urban Development
- University of Tehran Center for Quality Assurance
- Iranian Journal of Engineering Education
- Dean of University College of Engineering
- Quality Assurance Center of Faculty of Engineering
- Representative form collaborative centers with signed MoU.

The titles of speeches presented in this seminar:

- Challenges of engineering education in Iran (Professor Farajidana)
- Engineering education internationalization (Professor Tougighi)
- Engineering education and industry (Professor Shekarchzadeh)
- Engineering initiatives at UNESCO (Professor Nasiri Gheydari)
- A year with UNESCO Chair on Engineering Education (Professor Hossein

Memarian)

The videos of these lectures are posted in the chair website (ucee.ut.ac.ir).



Advisory board seminar (Nov 15, 2016)

Chair also hosted 7 educational workshops which were listed in the previous sections of this report.

**ii) Other conferences/organizational activities undertaken by the chair holder**

**iii) A selection of conference presentations by the Chair holder and other colleagues**

- Lecture by the chairholder entitled “assessment of the quality of engineering education from thought to action”, in the 3<sup>rd</sup> National Conference & 10<sup>th</sup> Annual Seminar on Quality Assessment of University Systems, April 26, 2016, Tarbiat Modares University, Tehran.
- Lecture by the chairholder entitled “ethical challenges of higher education in Iran”, August 29, 2016, in Iranian Association for Ethics in Science and Technology, Tehran.



Ethical challenges of higher education in Iran, Aug 29, 2016

**C) Interuniversity Exchange/Partnerships**

- a. Presenting a successful engineering education program and training graduates

with necessary skills to carry out effective jobs in the industry require consultation and collaboration with all the beneficiaries in engineering education. UNESCO Chair on Engineering Education creates an opportunity for the exchange of ideas and findings among these centers by signing MOUs with the beneficiaries of the engineering education. During the 2015-2016 report period, MOU is signed with the following institutions:

- Faculty of Engineering University of Isfahan
- UNESCO Chair on Teachers as Lifelong Learners

b. Starting a trilateral cooperation (Germany, Afghanistan and Iran) to promote the educational abilities of Afghanistan mining and geology faculty members (described in more detail in part 2-b of this report).

**d) Publications/Multimedia Materials**

	[no.]
Books	<input type="text"/>
Books (edited)	<input type="text"/>
Books (chapters)	<input type="text"/>
Monographs	<input type="text"/>
Research Reports	<input type="text"/>
Journal Articles (refereed)	<input type="text"/>
Conference Proceeding	<input type="text"/>
Occasional Papers	<input type="text"/>
Teaching/Learning Materials	<input type="text"/>
Multimedia Materials (CD-Rom)	<input type="text"/>
Multimedia Materials (Video)	<input type="text"/>
Multimedia Materials (Other)	<input type="text"/>

**i) Theses**

**ii) Publications**

**Book**

Memarian H. et.al. 2017. Some experiences of quality assessment in higher education of Iran: horizons and perspectives. Institute of Research and Planning of the Ministry of Science, Research and Technology.

Memarian H., 2016. Innovation in Engineering Education, 2<sup>nd</sup> edition, Tehran University Press, 439 pp.

**Papers**

Memarian H. 2016. Foresight and rethinking on engineering education. National

Conference on Rethinking and foresight in the Iranian Teaching and Learning System in View of the Rapid Contemporary Global Changes (RFITLS), UNESCO National Commission, Tehran, 22-23 Feb. 2016, 10 pp.

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

Participating in the meetings held by Iranian National Commission for UNESCO

- Cooperation with Iranian National Commission for UNESCO to prepare national document of UNESCO 2030 education (UNESCO Chair on Engineering Education was responsible for committee 4b, promoting international cooperation in engineering education).
- Actively attending the meetings held by UNESCO National Commission.

#### **f) Others**

- UCEE hosted a trainee from Germany for 2 months in summer 2016.
- Designing and publishing the 1<sup>st</sup> UCEE E-Newsletter, February 2017.
- Updating and improving the quality of bilingual website of the UCEE.
- UCEE attends in Engineering Training in the 1st International Conference of “Water and Environment in the New Millennium: education and capacity building” at Tehran University on 3-5 December 2016.

### **۴. Future Plans and Development Prospects**

Predicted five-year action plan for UNESCO Chair on Engineering Education (2014-2018)

۱. Cooperation with universities and related centers to expand the process of accreditation of engineering education programs.
۲. Supporting research projects on challenges of engineering education.
۳. Defining annual prizes for the best research projects on engineering education.
۴. Holding training courses and workshops for professional development of faculty members and teaching assistants (TA).
۵. Promoting the process of retraining engineers employed in industry and seeking industry collaboration to promote the professional engineer (PE) program in the country.
۶. Collaboration for design and participation in launching educational courses, including master's degree program, in engineering education.
۷. Presenting educational and research advice and services to universities, organizations and industry.
۸. Expanding the activities of chair to neighboring countries and others in the region, toward establishing the “Regional Center for Engineering Education”.
۹. Establishing links with related centers and UNESCO chairs at international level, in order to exchange the findings.
۱۰. 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 chairholder.

**Steering Committee:** The role of steering committee is to propose the general guidelines and monitor the macro policy of the chair. The 19 members of this council (18 full professors and 1 associate 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:** The structure of the chair office consists of public and international affairs director, executive director and secretary.

### 2) Financial Resources (annual)

		Amount (\$)
Host Institution	■	33000
Partner Institution	■	2000
Government Body	□	-----
Other Public Institutional/Body (incl. Research Councils)	■	1000
UNESCO	□	-----
Other UN Agency	□	-----
IGO	□	-----
NGO	□	-----
Industry	□	-----
Other Private	□	-----

**Professor Hossein Memarian**  
UNESCO chairholder for Engineering  
Education 30 May 2017



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