



UNESCO Chair on Engineering Education (UCEE)

Annual Report 2020-2021

- **Title of the Chair:** UNESCO Chair on Engineering Education, UCEE (<https://ucee.ut.ac.ir>)
- **Host Institution:** University of Tehran, Iran, (www.ut.ac.ir)
- **Date of establishment of the Chair:** April 26, 2014
- **Period of activity under report:** April 2020-April 2021
- **Report composed by:** *Hossein Memarian*, UNESCO Chair holder for Engineering Education, and Professor of Geo-engineering, University of Tehran, (<https://profile.ut.ac.ir/en/~memarian>)

1. Executive Summary

The primary initiative for launching UNESCO Chair on Engineering Education (UCEE) started in 2010. The Chair was officially founded on April 26, 2014, at 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. The following report covers the activities of the Chair from April 2020 to April 2021.

Note: During the mentioned period, the **Covid-19 crisis** has still caused disruptions to face-to-face activities and meetings; therefore, UCEE continued to focus on improving online activities.

Considering the specific circumstances during the Covid-19 crisis in the early months of 2020, the main activities and research projects can be summarized as follows:

- **Educational design:** Designing new educational programs for engineering education,
- **Educational Training:** Holding educational workshops on Engineering Education,
- **Lecture:** Sharing oral and virtual presentations in various areas of engineering, at different universities and professional centers,
- **Research:** Conducting diverse research projects on different areas of engineering education,
- **Publications:** Publishing new books and research articles in engineering education,

- **Contribution:** Being active members of:
 - The board member of the Iran Society of Engineering Education (ISEE). Head of ISEE's branch at the University of Tehran,
 - The board member and Iranian Institute for Accreditation of Engineering Education (IIAEE),
 - Center for the Quality Assessment of the College of Engineering of the University of Tehran,
 - Engineering Branch of the Academy of Sciences of Iran.

2. Activities

2-1. Education/Training/Research

2-1-1. Education (leading to certificate)

- Continuing the implementation and management of the new graduate program "*Master of Engineering Education*", which is the first of its kind in Iran. The second group of applicants was admitted to this program on September 2021.
- Planning and approval of the implementation of the existing master's program in engineering education for regional country applicants. Due to the Covid pandemic and unrest in the region, this has not been implemented yet.

Call for
International Student
Admission
**Master of
Engineering Education Program**



Introduction

During recent decades, there have been many developments in higher education and the teaching-learning process worldwide. These developments necessitated research and planning in engineering education. Thus, to meet this need, "Engineering Education" courses have been designed and implemented. Today, many of the world's top universities offer Master's and Ph.D. programs in engineering education. In line with this trend, UNESCO Chair on Engineering Education (UCEE) designed the "Master of Engineering Education" with the initiative of the University of Tehran. This program will be offered for international applicants in September 2021.

Admission requirements

- Having a bachelor's degree or higher in engineering
- Be a faculty member of engineering
- Passing the online entrance exam
- Paying of relevant fees and submitting the payment confirmation receipt



Learning Outcomes

The graduates of this program will have the following abilities:

- Engineering education planning in universities and industry
- Organizing, managing and monitoring the proper implementation of educational programs
- Documenting and managing engineering education information
- Quality management of engineering education programs
- Taking part in the leadership of the evaluation of engineering education programs
- Detecting the needs of engineering faculty members for planning and monitoring the implementation of professional development programs
- Organizing, managing and monitoring the proper implementation of in-service training programs in the industry
- Assisting engineering students in improving the quality of learning
- Research on the challenges of engineering education



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2-1-2. Training (short-term)

During the reported period, at the request of the Iranian Institute for Accreditation of Engineering Education (IIAEE), a workshop on "Reviewing and Improving the Quality of Engineering Education Programs through Accreditation", was held for the internal assessment group of the Aerospace department at Sharif University (31 January 2021).

2-1-3. Research

Several research projects were carried out by the Chair during the reporting period. The results of these projects 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. The steering committee approved the results of the following research projects during its monthly meetings. Most of these approvals were implemented at the College of Engineering of the University of Tehran and were also posted on the website of the Chair as "Educational Suggestions" to be used by other universities.

Educational Suggestions (Small-Scale Research Projects)

The investigations and research were completed in the reporting period and were promoted and posted on the website of the chair under the general title of educational suggestions (as noted by our slogan: small steps for a better future).

1. Regional Information Center for Sciences and Technology (IRCEST)
2. Top 200 web learning tools
3. UNESCO Resources on Covid19 and Education
4. Self-assessment of faculty members
5. Islamic Educational Scientific and Cultural Organization (ISESCO)
6. Why? How? and What?
7. UNESCO Resources on COVID-19 and Education
8. What is a Ph.D.?

Supervising MSc thesis on Engineering Education (underway)

1. The pathology of E-learning in the context of Engineering Education and developing a novel instructional design framework for blended learning
2. Design of an Engineering Faculty Development Program in the area of Teaching and Learning
3. Predicting university classrooms' mode of instruction in the post-corona world with the help of data mining approaches

2-2. Conference/Meeting

2-2-1. Conferences/organizational activities undertaken by the Chair

- UCEE held a webinar on the “mechanism of monitoring higher education graduates, with an emphasis on engineering education” with the speech of Dr. Gharoon from the Institute for Research and Planning in Higher Education. The webinar was held on 14 April 2021.
- Regular meetings of the Steering Committee and the chairholder (13 January 2021, 17 February 2021, 14 April 2021, 21 October 2020, etc.



- The fourth annual joint meeting of "Members of the Steering committee, Board of Advisors, Collaborating Centers and Supporters of the UNESCO Chair on Engineering Education", 18 November 2020.



1-2-2. A selection of international conference presentations by the Chair

- Mr. Amirreza Mehrabi, an MSc student in Engineering Education, participated in a Gathering meeting of American faculty members on the challenges of engineering education during the time of Covid- 19 crisis and after, on 9 & 15 February 2021 and made a report on the discussed issues and UCEE achievements.

2-3. Interuniversity Exchange/Partnerships

- To achieve the goal of "transition from Quantity to Quality in Engineering Education", UCEE incorporated with the Iranian society of engineering education invited the faculty of psychology and educational sciences of Kharazmi University to participate in a research project on "how to improve the quality of factors that constitute engineering education", 1 August 2020.
- Following the UCEE recall for gathering the best educational experiences of faculty members during the pandemic, in February 2019, received teaching experiences (text or video) were refereed. Seven selected experiences were appreciated and presented in a meeting on 16 July 2020.
- Chair holder participated in the Joint meeting of UNESCO Chairs of Tehran University

held on 12 May 2020 and 13 January 2021 and gave a lecture on UCEE's activities and outcomes.



Joint meeting of UNESCO Chairs of Tehran University; 12 May 2020

-UCEE participated in Iran- Russia Joint Scientific Webinar on “Universities in the context of COVID-19: the experience of Iran and Russia” held on 26 April 2021. The chairholder, Prof Memarian, and Prof. Abbas Bazargan, members of UCEE's steering committee, talked about the Iranian experiences.

APPraise
APPLYING PROGRESS THROUGH RESEARCH AND INNOVATION

Universities in the context of COVID-19
The experience of Iran & Russia

JOINT IRAN-RUSSIA WEBINAR

<p>Dr. Eduard Galazhinsky Rector of Tomsk State University New experience in university management during the COVID-19 pandemic.</p> <p>Dr. Alexander Vorozhtsov Vice-Rector for Research Academic science in the context of COVID-19 pandemic: preserve or multiply?</p> <p>Dr. Mikhail Shepel Director of the Institute of Distance Education Transformation of higher education: from full-time education to distance education</p> <p>Dr. Irina Kurzina Head of Chemical Department Teaching chemistry online</p> <p>Dr. Sergey Nikolayevich Filimonov Dean of the Faculty of Physics Alt-shift project: Bilingual lectures on physics in mixed online-offline mode</p> <p>Dr. Diane Dammer Head of Institute of Applied Mathematics and Computer Science Online adaptive mathematics course</p>	<p>Dr. Nili Ahmadabadi President of University of Tehran Welcome and experience in university management during the COVID-19 pandemic.</p> <p>Dr. Mehdi Sanaei Advisor to UT President in Cooperation with Russian Federation and Eurasian Countries World order in Post-coronavirus Era</p> <p>Dr. Hossein Memarian UNESCO Chair-holder for Engineering Education UNESCO Chair on Engineering Education and its experiences in the context of COVID-19</p> <p>Dr. Nasrin Noorshahi Director of Institute for Research and Planning in Higher Education Iranian Higher education policies and programs during the Covid-19</p> <p>Dr. Aliakbar Safavi Head of E-Learning Committee at the Ministry of Science, Research and Technology Iranian e-learning experiences in Covid-19 pandemic</p> <p>Dr. Omid Fatemi Chief Information Officer at the University of Tehran E-Learning, the enabler for the new paradigm for future education</p>
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April 26th 2021 12:30 -15:45 Tehran time
11:00 -14:15 Moscow time

National Research Tomsk State University
University of TEHRAN

Following the approval and appointment of the officers, the "office of the ombudsman"

officially started working for the first time in Iran, in the College of Engineering, University of Tehran. The proposal for establishing the ombudsman office and preparing its regulation and bylaw was done by UNESCO Chair on Engineering Education. (<https://engdadvar.ut.ac.ir/>)



Presenting a lecture by the chairholder on "the state of engineering education in Iran", at the ceremony of the founding new branch of the Iranian Society of Engineering Education, at Shahid Chamran University, Ahvaz (19 January 2021)

The chairholder presented a lecture on the mechanism of student-centered education, for the faculty members of Shahid Beheshti University, Tehran (10 August 2020).



Shahid Beheshti University, 10 August 2020-

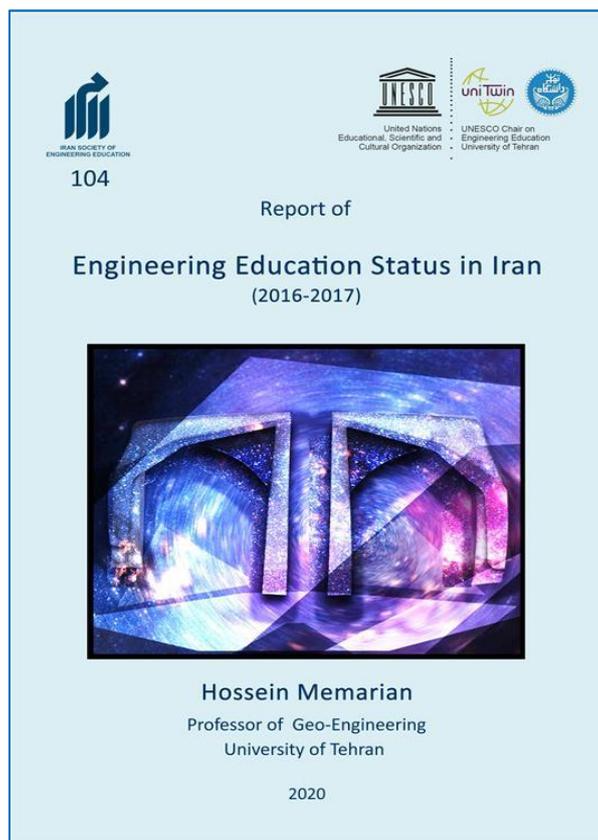
- Cooperation with the Civil Engineering Department of the College of Engineering of the University of Tehran in holding the 4th annual "blue-sky ideas" Competition.
- Chairholder presents a lecture at the meeting held for monitoring the process of the internal assessment, at the University of Science and Technology, Tehran (2nd December 2020).
- The Iranian Mining Engineering Association invited the chairholder to hold a lecture

entitled "Challenges of engineering students in online education" (19 December 2020).

2-4. Publication

2-4-1. New Book

- Memarian H. 2202. Engineering Education in Iran (2016-2017), Iran Society of Engineering Education Publication No 104, 214 pp., This book was the first of its kind in Iran and was unveiled on 16 September 2020. (<https://ucee.ut.ac.ir/cms/112912>)



2-4-2. Journal Articles (refereed)

- Being a member of the editorial board of the Journal of Research in Engineering Education (EER). <https://www.springer.com/journal/42452/updates/17277408>
- Iranian Journal of Engineering Education, Academy of Sciences of Iran.

2-4-3. Multimedia Materials (Video):

- On the occasion of Iran Engineer Day (23 February 2021), Prof Hossein Memarian participated in an interview with the Tehran University website, expressed his views on the state of engineering education in the country, engineering education programs, measures to be taken, and explained suggestions for overcoming the pitfalls and

improving the quality of engineering education

- Updated and maintained the bilingual website of the UNESCO Chair on Engineering Education (ucee.ut.ac.ir)

2-4-4. Cooperation with UNESCO Headquarters, Field Offices

- The Chair holder participated in the "Second Meeting of the Coordinating Council of International Organizations and Assemblies" on 4 January 2021 and gave a lecture.



"Second Meeting of the Coordinating Council of International Organizations and Assemblies" on 4 January 2021

3. Future Plans and Development Prospects

3-1. Current investigations and Research:

- Determination of learning styles
- Evaluating the effectiveness of the educational programs
- Universal Design for Learning (UDL)
- Preparation of teamwork
- Identity development and learning
- Yesterday, today, and tomorrow of engineering education
- Mindset and Learning
- Cognition, metacognition, and learning
- Mechanism of course design
- Principles of effective learning

Appendix

1. Human Resources:

The Chair structure consists of the Steering Committee, the board of advisors, and the office of the Chair.

- **Steering Committee:** The role of the strategic council is to propose the general guidelines and monitor the macro policy of the Chair. The 18 members of this council (including 12 full professors) represent different fields of engineering at the College of Engineering, University of Tehran.
- **Advisory Board:** The purpose of the advisory board is to provide 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: 35000 \$
- NGO: 4000 \$

3. Space

- A 120 square meter office, with three personnel

Address:

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Hossein Memarian

A handwritten signature in black ink, appearing to read 'H. Memarian', followed by a long horizontal line that ends in a small hook.

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