

Proposal

UNESCO Chair in Engineering Education

University of Tehran, University College of Engineering

A. INSTITUTIONAL DATA

1. **Project title:** Engineering Education & Accreditation
2. **Expecting starting date:** September 2010
3. **Duration:** 4 years
4. **Domain(s) or discipline(s) concerned:** Engineering Education, Engineering Accreditation
5. **Name and full address of the host institution(s):** University College of Engineering, University of Tehran, 16th of Azar Street, Enghelab Ave, Tehran, Iran. P.O. Box 11155-4563,
<http://eng.ut.ac.ir>
6. **Faculties & Departments concerned:**
 - i. School of Electrical and Computer Engineering,
 - ii. School of Civil Engineering,
 - iii. School of Mining Engineering,
 - iv. School of Mechanical Engineering,
 - v. School of Chemical Engineering,
 - vi. School of Metallurgy and Material Engineering
 - vii. Department of Engineering Science
 - viii. Department of Surveying and Geometrics Engineering
 - ix. Department of Industrial Engineering
 - x. Caspian Campus of Engineering
 - xi. Fooman Campus of Engineering
 - xii. Institute of Petroleum engineering
 - xiii. Construction Materials Institute
7. **Executing institution:**
 - i. **Project Leader:** Professor Hossein Memarian (CV attached)
 - ii. **Address:** Tehran, North Kargar St, University College of Engineering, School of Mining Engineering, Memarian@ut.ac.ir (Office: Shirban, No 429, Taleghani St, Tehran, Iran, isee@isee.ir)
8. **Partners:**
 - i. All the schools and departments listed in part 6 (above)
 - ii. Centre for Engineering Accreditation, University College of engineering
 - iii. Quality Assurance Centre, University of Tehran
 - iv. Individuals
 - Professor Mahmoud Kamarei (Electrical Engineering)
 - Professor Mahmoud Nilli Ahmadabadi (Material Engineering)
 - Professor Parviz Jabejdar-Marlani (Electrical Engineering)

- Professor Behrouz Gatmiri (Civil engineering)
 - Dr Mahmoud Shekarchizadeh (Civil Engineering)
 - Professor Abbas Bazargan (Department of Educational Management and Planning)
 - Professor Rahmat Sotudeh Gharebagh (Chemical Engineering)
 - Professor Mahmoud Mosavi Masshadi (Mechanical Engineering)
9. **Total project budget (US \$):** 100,000 per year
10. **Funding sources** (organizations, bodies and amounts)
- i. In cash(US \$): 60,000
 - ii. In kind(US \$): 40,000

B. PROJECT DESCRIPTION

1. Type of project: UNESCO Chair
2. Domain(s) or discipline(s)
 - i. Engineering Education
 - ii. Engineering Accreditation
 - iii. Regional educational cooperation
 - iv. International educational cooperation

3. **Summary of the project:** The establishment of University of Tehran in 1934 marks the birth of modern engineering education in Iran. The Engineering Faculty of Tehran University commenced its activity by registering 40 students in four departments of Civil, Mining, Mechanical and Electrical Engineering. For a few decades, Tehran University was the only higher education institution of Iran offering engineering programs. Later, new universities offering engineering education were founded in Tehran and major provinces.

Prior to the revolution of 1979, each university had the authority to develop its own engineering programs, although most of the existing engineering departments followed the University of Tehran curriculum. Since the revolution, Iran has been developing a centralized higher education system, where all the university programs are designed and accredited by the Ministry of Science, Research and Technology (MSRT). The board of planning for post secondary engineering disciplines normally consists of university professors, as well as representatives from the industry and the ministry.

In the past two decades, there has been an excessive expansion of higher education institutes and a significant increase in the number of engineering students and graduates. In recent years, different areas of reform have been suggested, providing incentives for public institutions to diversify sources of funding, redefining the role of government in higher education, and introducing policies unequivocally designed to give priority to the quality and equity objectives.

New regulations, which have been introduced recently, have given some autonomy to more established universities, which has enabled them to modify (diversify) the present programs. This decentralization trend urges developing new policies and regulations, among them are new methods for quality control of engineering programs and graduates.

Each university program should have defined objectives and a system of evaluating its success', which in part reflects the readiness of students for their future involvement in industry. The quality of higher education can be achieved through internal control of academic programs, government regulations, market mechanisms and accreditation. Independent organizations, similar to the US Accreditation Board for Engineering (ABET), and the Canadian Engineering Accreditation Board (CEAB) have not been active in Iran and almost every aspect of education, ranging from accreditation of programs, to decisions about the number of students, as well as evaluation of universities offering engineering, has been planned and supervised by the government.

Present project plans to monitor deficiencies of engineering education in Iran and design a system of national accreditation for engineering programs, in line with the internationally accepted standards. The outcome of these activities can later be shared regionally.

4. Objectives

i. Long term:

- Developing a national system of independent accreditation, to make a balance between the needs of industry and the engineering graduates' competencies.
- Sharing the outcomes regionally to upgrade engineering education and setting up a UNITWIN Network for engineering education in this part of Asia.
- International recognition of domestic accreditation (e.g. Joining Washington accord).
- Increase ties between educational institutions and industry (through lifelong learning educational programs, distance education, etc).

ii. Short term:

- Establishing an organization (NGO) for national engineering education accreditation,
- Promoting accreditation nationally (e.g. by lectures, workshops, short courses, conferences and publications); and exchanging the outcomes regionally,
 - a. Monitoring engineering education, spot the pitfalls and propose remedial actions; Focus on challenges of woman engineer in school, society and industry
 - b. Encourage research and graduate studies in engineering education
 - c. Scrutinize new international developments in engineering education and promote them nationally

5. Type of activities:

- i. Postgraduate teaching program: Supporting postgraduate thesis on engineering education
- ii. Short term training: Offering short term training to universities and industry
- iii. Research: Promoting research about different aspects of engineering education
- iv. Visiting professorships and exchange student
- v. Scholarship: Trying to raise research funds from industry and other sources
- vi. Institutional development

6. **Type of beneficiations:**
 - i. Students
 - ii. Academics
 - iii. Professionals
 - iv. Others

7. **Visibility and expected results at the national, regional and international level:**
 - I. Papers & reports
 - II. Website
 - III. Lectures
 - IV. Workshops
 - V. Short courses
 - VI. Conferences

8. **Implementation strategy – How the project will be implemented:**
 - i. **Management:** Establishment of the engineering accreditation office in University College of Engineering, University of Tehran.
 - ii. **Capacity-building:** Cooperation with Iranian Society of Engineering Education (ISEE) and Iran Academy of Science (IAS) to develop the managerial and executive scheme for proposed accreditation system.
 - iii. **Sustainability:**
 - **Linkage with other relevant activities at institutional, national, regional and international levels:** Developing close ties with higher institutions offering engineering programs in Iran; trying to link with similar centers in regional and international levels.
 - **How will benefit be sustained?** Engineering is a universal phenomenon and engineering education should prepare its graduates to work in this global system. In this situation, the engineering programs should follow a universal standard. Quality assurance sustained by accreditation.
 - iv. **Transfer of Knowledge:** Exchange findings with similar interested centers, nationally, regionally and internationally.

9. **Proposed schedule for major activities:**
 - i. Designing a national system for engineering education accreditation and present it to Iran Society of Engineering Education (ISEE); 2010
 - ii. Establishing a centre for engineering education accreditation in Tehran University; 2010.
 - iii. Internal accrediting of engineering programs of Tehran University; 2010-2011.
 - iv. Transferring findings to other interested higher institutions offering engineering programs (through reports, papers, lectures, short courses, seminars, etc.); 2011.
 - v. Assisting to establish a national centre for engineering education accreditation: 2011
 - vi. Starting national accreditation of engineering programs; 2012.

- vii. Monitoring engineering education in Iran, spot the pitfalls and propose remedial actions; 2010-2014.

C. PARTNERSHIPS/NETWORKING

1. Participating partner institutions

i. Confirmed:

- Iranian Society of Engineering Education (ISEE)
- Iran Academy of Science (IAS)
- Quality Assurance Centre, University of Tehran

ii. Proposed:

- Major universities offering engineering education
- Ministry of Science, Research and Technology

2. Other inter-university networks for partnership

- i. Planning for UNTWIN Network on Engineering Education

D. FUNDING THE PROJECT

1. Total project budget(in US\$): 100,000 per year
2. Contribution of your institution(in US\$): 70,000
Budgetary provision (in US\$): 30,000
In kind services (in US\$): 40,000
3. Extra budgetary to be mobilized (in US\$): 30,000
 - i. From alumni and industry

E. SUPPORT

1. Institutional support:

- i. Preparing office and executive supports
- ii. Funds for activities

2. UNESCO support: To be negotiated

3. Support by the national commission for UNESCO in the country concerned: To be negotiated

4. Other support:

F. COMPLEMENTARY PRECISIONS