

# Work in Progress - International Summer Engineering Program at METU: A Bridge to Global Competency

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**Abstract - The International Summer Engineering (ISE) Program at The Middle East Technical University (METU) in Ankara, Turkey, is designed to leverage many unique bridging characteristics of METU and Turkey to allow US and METU engineering students to quickly strengthen their global competency skills. METU was established through a Turkish-American Cold War initiative in the late 1950's and is based on the American university model. The ISE Program is designed for equal numbers of exchange and METU students. The structure of the program encourages US and METU students to interact formally on class projects and informally outside of class. The first class being offered through this program is the 4<sup>th</sup> year technical elective class Fuel Cell Fundamentals.**

*Index Terms* - Global competency, engineering education, exchange, international, study abroad.

## INTRODUCTION

In the late 1950's, Dr. W. Woolrich, former Dean of Engineering at The University of Texas-Austin, Dr. E. Burdell, former President of Cooper Union University, New York City, and Dr. H. Stassen, former President of The University of Pennsylvania, collaborated with Turkish academics and statesmen to establish The Middle East Technical University (METU) in Ankara, Turkey, as a Cold War initiative on the American land-grant state university model [1]. While the Cold War has ended, the world faces a new set of global engineering challenges related to sustainability and globalization [2] [4]. The International Summer Engineering (ISE) Program at METU leverages the unique legacy of Turkish-American collaboration at METU to prepare globally competent engineers.

## ABOUT METU

**English Medium University in a Turkish Speaking Country:** All classes at METU are taught in American English. Therefore US engineering students without a strong second language can easily come to METU and take regular engineering classes with regular METU students while still gaining valuable experience living in a country where many people do not know English.

**ABET Accredited:** All undergraduate engineering programs at METU are certified by ABET as being substantially equivalent to a US program ([www.abet.org](http://www.abet.org)).

**World Class Engineering Programs:** In 2003 METU ranked 7<sup>th</sup> in the world among non-US universities in number of graduates who eventually obtain a Ph.D. in engineering from a US university [5]. This ranking is indicative of both the quality and the breadth of the METU engineering programs, which indicate an opportunity to scale-up the ISE Program.

**Large Park-Like Campus in a Major City:** In contrast to the living conditions throughout much of Turkey, which many Americans may find as dense, urban, and often noisy, the METU campus is quiet and similar in many respects to a suburban US campus. These characteristics make the METU campus arguably one of the easiest places for an American with limited international experience to live in Turkey.

**Turkey's Best Students:** Recognized as one of the most prestigious universities in Turkey, admission to METU engineering programs is limited to the top ~ 1% of Turkish high school students.

## ABOUT TURKEY

**Culture, Politics and History:** Spanning Europe and Asia geographically, culturally, and politically, Turkey provides a bridge between East and West. While Turkey's population is almost entirely Muslim like its Eastern neighbors, the Islam practiced is often described as being more tolerant and moderate. The government is secular and is similar to the governments of many European countries to its West. Turkey's largest city, Istanbul, was the capital of two of the largest empires in history. From 330 to 1453 it was Constantinople, capital of the Christian Byzantine Empire (or Eastern Roman Empire). From 1453 to 1922 Istanbul was capital of the Islamic Ottoman Empire. Like much of Turkey, the city of Istanbul is still adorned with many beautiful churches, mosques, and palaces, reflecting its rich historical past.

**A Traveler's Paradise:** Due to its sun drenched *Turquoise* coast, incredible historic sites, and varied geography, Turkey is a favorite vacation destination. In 2007 was the 9<sup>th</sup> most visited country in the world ([wikipedia.org](http://wikipedia.org)).

**Strategic US-Turkish Alliance:** Due to geopolitical considerations, the US and Turkey have historically enjoyed a strong strategic alliance that enhanced the national security of both countries. Boren Scholarships and Fellowships ([www.borenawards.org](http://www.borenawards.org)) have identified Turkey as a country that is also critical to future US interests but is currently underrepresented in terms of study abroad students. To cultivate this important alliance, Boren is offering scholarships to US students to study in Turkey.

### ISE PROGRAM AT METU

The ultimate goal for the ISE Program at METU is to serve as a scalable, academically rigorous bridge that engineering students can use to rapidly increase their global competency. The program is specifically structured for students with little to no international experience. Like all exchange programs, the ISE Program at METU will give students international experience by living, studying, and traveling in Turkey. However, unlike many exchange programs, one of the explicit goals for this program is to also give exchange students experience working with METU engineering students on class projects. The program will also encourage METU and exchange students to interact outside of class.

The initial course being offered is the 4<sup>th</sup> year technical elective course Fuel Cell Fundamentals. The United Nations Industrial Development Organization-International Centre for Hydrogen Energy Technologies (UNIDO-ICHET), located in Istanbul, is a co-sponsor for this course. The course is adapted from a regular semester fuel cell course to be accessible to a wide range of engineering students and to include content to strengthen global competency skills. In parallel with the lecture, students will work in small teams to develop a computer model to predict the voltage-current characteristics of a fuel cell as key operating conditions such as power output, humidity, pressure, and theoretical air are varied. To the extent possible, teams will consist of an exchange and a METU student. The class includes a fieldtrip to UNIDO-ICHET in Istanbul for a series of lectures and laboratory experiments coordinated by ICHET's international team of researchers. UNIDO-ICHET will cover the travel and lodging costs for this field trip as a scholarship to all students.

Students should find the cost for the ISE Program at METU to be significantly less than that for other similar international engineering programs. Dorm and program fees for the 6-week course are \$950 for the 2009 program. Students are responsible for their plane ticket, food, books, travel/entertainment and other incidental costs. Daily living and traveling costs tend to be much less than in Western Europe.

A web site is available with more detailed program information ([www.me.metu.edu.tr/exchange/](http://www.me.metu.edu.tr/exchange/)).

### CONCLUSION

For reasons related to culture, history, geography, politics, and economics, Turkey in general and METU specifically are in a unique position to serve as bridge to global

competency for engineering students with little to international experience but a strong desire to become more globally competent. The International Engineering Summer Program at METU is specifically designed to leverage these unique bridging characteristics of METU and Turkey while overcoming several remaining barriers to provide a value-added educational experience. The program is structured to facilitate formal and informal interaction between exchange and METU students. The first engineering course being offered through this program is the 4<sup>th</sup> year technical elective course Fuel Cell Fundamentals. In future years the program will be expanded to include a new and popular engineering course Sustainable Systems Engineering.

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