

## ENGINEERING EDUCATION IN VIETNAM

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Vietnam has begun to implement a reorganization of its higher education system. From 1979 through 1989, Vietnam was strongly influenced by the Soviet Union and higher education focused on Soviet Studies, Russian language instruction, and science and engineering curriculums dominated by work done in the Soviet Union. In 1989, the Vietnamese government embarked on a policy that would shift it away from a dominant Soviet influence and move toward a market economy featuring private property with a guiding role played by the state. Higher education was a very important component of this transformation. It was designed to ensure Vietnam a human resource base to keep pace with needs created by the anticipated economic success.

The Vietnamese government devised a plan using the concept of a national university system with campuses in Hanoi and in Ho Chi Minh City. Regional universities were to be established in Hue, Da Nang, Can Tho, Thai Nguyen, and other cities. A system of community colleges was also established and provision was made for private universities and colleges. The prior system had a large number of separate, independent universities, each with a very specialized academic role and all reporting to the Ministry of Education and Training in Hanoi. For example, in Ho Chi Minh City, there were seventeen separate universities and colleges (Fig. 1). After consolidation, the Vietnam National University, Ho Chi Minh City (VNU, HCMC) has 10 Colleges including a College of Engineering (Fig. 2). There is also a separate University of Medicine, Pharmacy and Dentistry and a semi-public Open University. A similar structure was established in Hanoi although at the present time the Hanoi University of Technology in Hanoi remains an independent institution from the Vietnam National University, Hanoi (VNU, Hanoi).

Over the past 4 years, California State University, Sacramento has established a close working relationship with several universities in Vietnam. This relationship included faculty exchanges, assistance in purchasing equipment's and supplies and presentation of technical papers. In November 1996, under the sponsorship of the Division of South Asia Programs of the National Science Foundation, a workshop was convened at CSU, Sacramento to bring together engineering and science educators from the principle colleges and universities in Vietnam with some of their counterparts in the United States. The purpose of these meetings was to exchange information on science and technology curriculums, discuss educational objectives of the two countries and to investigate the possibilities of joint research projects and exchange programs for faculty and students.

The participants from Vietnam included the Vice President and senior academic administrators of Vietnam National University, HCMC in the College of Engineering, Natural Sciences, and General Studies and the Hanoi University of Technology. US participants included the Vice

President for Education of the American Society of Mechanical Engineers (ASME) and science and engineering faculty and administrators from the California State University in Sacramento, San Francisco, and Fullerton, the University of Pacific, Tufts University, the University of Massachusetts and the University of Northern California and several industrial representatives.

Establishing academic equivalencies with universities in Vietnam is difficult. There has not been a system of uniform entrance requirements through the various universities. Until just recently, the credit system was not used and curriculums were very inflexible. The general education (GE) content defined in the American Universities was not part of the curriculum. Unit requirements for each degree were substantially higher than in the United States reflecting the method of instruction, lack of textbooks and specialization of the curriculums. The Vietnamese participants were particularly interested in the organization and objective of ABET (Accreditation Board for Engineering and Technology) in the United States as there is no equivalent accreditation structure in Vietnam. Establishment of a similar organization in Vietnam was seen as a step towards improving overall coordination and management efficiency.

The engineering and science schools in Ho Chi Minh City have taken leadership position in establishing the credit system and redesigning curriculums for more flexibility. The system which is still in transition, will facilitate evaluation and allow easier exchanges of faculty and students abroad. The College of Engineering as well as the College of Natural Sciences at the Vietnam National University, HCMC has two functions. It trains Bachelor, Masters and Doctorate students in engineering and it also conducts research. There are ten faculties (departments) in the college and eleven research centers (Fig. 3 & 4). Bachelors students take between 4-6 years to complete the program. The first two years include the basic sciences, mathematics, and general studies courses totaling approximately 50 credits. These courses are still available on several campuses throughout the HCM City, but they have been slowly consolidated into the College of General Studies at a new campus in Thu Duc for the Vietnam National University, HCMC that is currently in the final planning stage. Professional studies are completed at the College of Engineering and require an additional 100 credits. The Hanoi University of Technology (HUT) has not been consolidated and all programs are offered on their campus. The program offerings and administration structure are similar to those in HCMC.

The masters degree requires 2 years additional study and the doctorate 2 to 3 years after the masters degree and includes a requirement to pass a qualifying examination and complete a dissertation. The research is almost all applied in nature and is generally sponsored through contracts with outside organizations. Both the College of Engineering (VNU, HCMC) and the Hanoi University of Technology have student exchange agreements with universities in other countries. For example, the College of Engineering in HCMC has a program with the University of Tasmania which is based on the 2+2 model. Students from Vietnam complete their first 2 years in Vietnam and are given full credit towards their degree from the University of Tasmania when they transfer. As with many programs of this type, one of the main difficulties for students is cost and at present Vietnamese transfer students must pay the full cost of tuition, travel and living expense when they move to Australia. At CSU-Sacramento, the university is looking at a similar program that would involve students from both countries being exchanged. In this situation students would pay their tuition to their home institution and the students involved from the United States would not necessarily have to be engineering students.

The workshop explored several areas of possible joint research activities. San Francisco State University has a Wheeled Mobility Center that has helped initiate wheelchair products in 30 shops in 25 different countries. Development of such a program in Vietnam would be highly desirable and a letter of intent to do so was conveyed to the Hanoi University of Technology. Several joint research projects in the environmental technology, solar energy conversion, bio-medical instrumentation, and computer integrated manufacturing are being discussed. Environmental protection is an area of particular interest in Vietnam and the Vietnamese have a great desire to avoid some of the problems experienced by other developing countries.

The universities in Vietnam are very anxious to establish relations with American universities. They have committed to establishing a common entrance examination for the different colleges and to move to the credit system which will facilitate the evaluation of courses when students transfer. Joint research projects will initially not involve high level collaboration, but will allow faculty to explore common interests and will eventually lead to more substantive involvement.

### **FIGURE 1**

#### **UNIVERSITIES IN HO CHI MINH CITY (Before Consolidation)**

1. University of Technology
2. University of Economics
3. University of Finance & Accounting
4. University of Architecture
5. University of Agriculture & Forestry
6. University of Education
7. Hochiminh City University
8. Technical Teachers Training College
9. School of Law (affiliated with Hanoi Law School)
10. University of Medicine, Pharmacy and Dentistry
11. Center for Medical Staff Training
12. College of Gymnastics and Sports
13. Hochiminh City Conservatory
14. HCMC College of Fine Arts
15. HCMC College of Culture
16. HCMC College of Theatre
17. HCMC Semi-public Open University

## **FIGURE 2**

### **UNIVERSITIES IN HO CHI MINH CITY (After Consolidation)**

1. Vietnam National University, HCM City
2. University of Medicine, Pharmacy and Dentistry
3. HCMC Semi-Public Open University
4. HCMC University of Foreign Languages & Information Technology  
(Private University - Community-Run)
5. Van Lang University (Private University)
6. Hung Vuong University (Private University)

## **FIGURE 3**

### **VIETNAM NATIONAL UNIVERSITY, HCMC COLLEGE OF ENGINEERING**

1. Faculty of Basic Sciences
2. Faculty of Chemical Engineering and Petroleum Processing
3. Faculty of Civil Engineering
4. Faculty of Electrical and Electronic Engineering
5. Faculty of Geology and Petroleum
6. Faculty of Industrial Art Design
7. Faculty of Industrial Management
8. Faculty of Information Technology
9. Faculty of Mechanical Engineering
10. Faculty of Postgraduate and In-Service Training

## **FIGURE 4**

### **VIETNAM NATIONAL UNIVERSITY, HCMC COLLEGE OF ENGINEERING CENTERS FOR RESEARCH AND APPLICATION**

1. Center for IT and GIS (DITAGIS)
2. Center for Environmental Technology and Management
3. Research Center for Thermal Equipment and Renewable Energy
4. Ceramic Material Research Center
5. New Material Research Center
6. Polymer Research Center
7. Color Chemical and High Quality Abrasives Research Center
8. Center for Computer Technology
9. Research Center for Technology and Industrial Equipment
10. Center for Civil Engineering