

Engineering Education for the 21st Century: Challenges in Designing Curricula for a 21st Century Graduate

Prof. L L Ratnayake, Senior Professor in Civil Engineering, IRQUE Project

1. Introduction

Prior to the early 20th century, engineering was taught in Guilds. In 1920's and 1930's, Universities too began to offer courses in engineering. During this period, the Ceylon Technical College at Maradana commenced training engineering graduates for the University of London external degree. It was the seedbed from which the first Faculty of Engineering at University of Ceylon's Colombo Campus was born. Today there are many engineering degree programs at Public Universities and Non-State Higher Educational Institutes.

At present, the global engineering and technology education has a well defined qualification framework: four years of academic training leading to an Honors Engineering Degree for Professional or Chartered Engineers, three years of academic training leading to an Engineering Degree for Incorporated Engineers or Engineering Technologists and two years of academic training leading to a Diploma for Engineering Technicians.

When engineering graduates are trained to be Professional Engineers or Chartered Engineers, they need to have a sound mathematical, analytical and scientific knowledge to solve complex problems, be able to face new challenges which no other engineers have faced in the past. The standard of a four year (consisting of eight academic semesters) Engineering Degree and the attributes of an engineering graduate are specified in the Washington Accord and the competencies required for a Professional Engineer is very well defined in this document.

When engineering graduates for a three year degree program are trained, they too should have a good mathematical, analytical and scientific knowledge; but they are expected to be involved in routine engineering design, construction or manufacturing etc. There are more jobs in this sector in any economy. The standard of a three year (consisting of six academic semesters) engineering degree, the attributes of a graduate and the competencies required for an Incorporated Engineer are specified in the Sydney Accord.

When Engineering Technicians are trained, they need to be given a good practical training with basic mathematical, analytical and scientific issues involved in carrying out operations and maintaining routine engineering skills. An Engineering Technician requires a two year Diploma qualification after the G.C.E. Advanced Level and the competencies required for an Engineering Technician is well defined in the Dublin Accord.

Although there is a well defined system for classifying engineering professionals to different groups, the importance of any of these groups should not be underestimated. As team players, all have specific roles to play in achieving the end result and the contribution of everyone is important.

