



# SEMM 4902

Professional Engineering Practice



# Chapter I

## Introduction



# Introduction

- What do we think about Engineering profession?
  - Engineering is an important and learned profession
  - As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity
  - Engineering has a direct and vital impact on the quality of life for all people

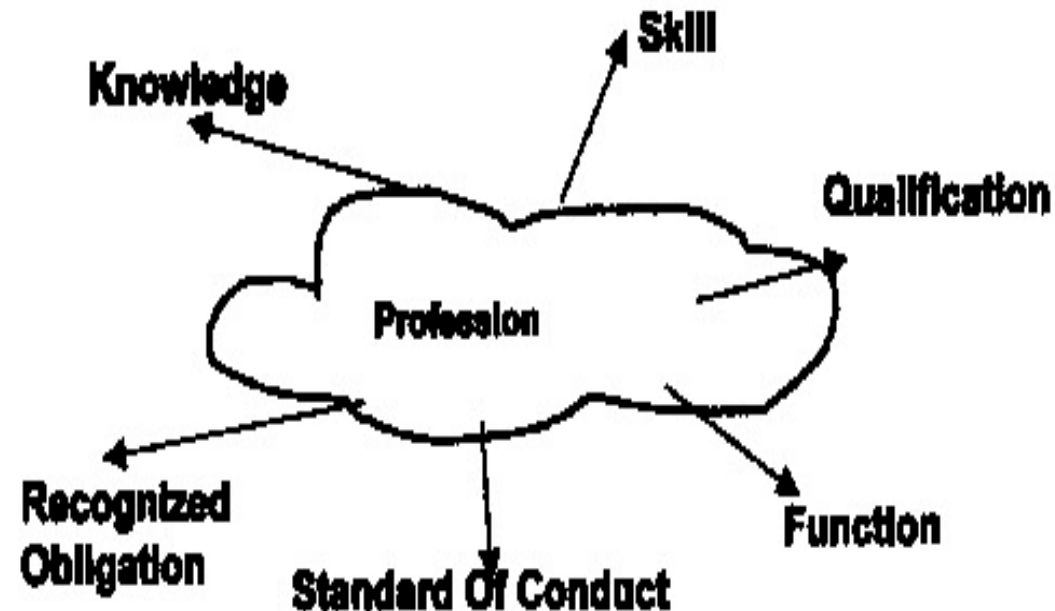




# Definition of Profession

- In the highest sense, a profession is an occupation that has the following six distinguishing marks:
  - A body of knowledge and art
  - An educational process
  - A standard of personal qualification for admission
  - A standard of conduct
  - A formally recognized status
  - Organizations of the profession

- In short a profession;
  - comprises a group of people selected through an education process.
  - having the authority that stems from the fact that the profession alone has the knowledge and skills, that are needed by members of the public or by the public at large.





# Professionalism

- The expression of ideas by which our profession should strive to serve the community.
- Professionalism is a way of thinking and living rather than an accumulation of learning.
- Professionalism cannot be taught by stating a code of ethics or by memorizing a set of rules.

# The Professional Man

- The characters/marks of a professional man are:
  - Professional activity
    - responsible, special skills
  - Motivation for services
  - Motivation for self-expression
    - joy & pride in the work to be done
    - self-imposed standards
  - Recognition of social duty
    - standards of profession
    - public understanding
    - public service

Unique  
Profession

# Engineering as a system

Engineering  
Education

Professional  
Bodies

Engineering as a system  
(set of practices)

Culture of  
Cooperation

Laws regulating the  
work of engineers








# Engineering Education In Malaysia


- During the pre-independent era, only 2 institutions offering engineering courses :
  - University Malaya
  - Technical College which has since been upgraded to the present UTM





# History of UTM


- The early history of the Technical School goes back to 1904 when personnel for the Public Works Department and the Survey and Land Offices were much needed for the development of mining towns in the Federated Malay States.
- The main objective of establishing a technical school was to train local personnel to man the on-growing infrastructure such as cart-road and railway lines from the mining centers - Taiping in Larut, Kuala Lumpur in Selangor and Seremban Sungai Ujung - to the Straits of Malacca


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- The early years of the 1900 saw Federated Malay States and the economic centers especially in the tin industry.
  - Rapid construction of cart-roads and railway lines was undertaken to replace the navigated rivers between 10 to 35 miles from the Straits of Malacca.
  - To meet the needs, a grant of £30,000.00 from a philanthropist for the establishment of a technical school in Kuala Lumpur was made in 1904.

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- This institution of higher learning began in 1904 as a class for technical studies at the Kuala Lumpur City Council building.
  - In 1906, the class became the Technical School, based at the Batu Lane Malay School.
  - It was later moved to the Museum building at Bukit Nanas


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- In 1925, the Public Works Department opened the Technical School in Jalan Brickfields (Jalan Tun Sambanthan), Kuala Lumpur to train technical staff of the Public Works Department and the Survey and Land Offices.
  - In 1930, the Kuala Lumpur Technical School was further expanded at its new site in High Street, i.e. the present Jalan Bandar


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- In 1941, it was recommended that the Technical School be upgraded to the status of a college.
  - However, with the advent of the Second World War, the suggestion could only be implemented in 1946, during which the institution became known as the Technical College, Kuala Lumpur.
  - The Technical College then offered three year Diploma courses in the field of Civil, Mechanical and Electrical Engineering, Architecture, Town and Country Planning, Land Surveying and Quantity Surveying

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- The construction of the new Technical College in Jalan Gurney (Jalan Semarak/Jalan Sultan Yahya Petra) Kuala Lumpur began in 1951. It became fully operational in march 1955.
  - In 1960 a milestone was reached when engineering courses at degree level were offered.
  - Students pursuing the courses had to sit for professional examinations conducted by the Institution of Civil Engineers, Institution of Mechanical Engineers and the Institution of Electrical Engineers, United Kingdom. The rate of success was most encouraging

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- In 1967, another milestone was reached when the Planning Committee for Higher Learning decided to upgrade the Technical College to the level of Institute of Technology with university status from 1969 onwards.
  - However it was only on 14<sup>th</sup> March 1972 that the decision was implemented with the establishment of the Institut Teknologi Kebangsaan (National Institute of Technology) under Section 6(1) of the University and College Act, 1971.




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- On 1<sup>st</sup> April 1975 the journey from school to university was completed when the institute finally became Universiti Teknologi Malaysia
  - Universiti Teknologi Malaysia now comprises two campuses,
    - The 18-hectare Jalan Gurney (Jalan Semarak/Jalan Sultan Yahya Petra) campus in Kuala Lumpur
    - The campus in Skudai which spans 1,777 hectares. The Skudai campus now serves as the main campus for the universiti. The first phase of the constructor of the new Skudai campus was completed in 1985 with two faculties; the Faculty of Built Environment and the Faculty of Surveying commencing their courses here for the 1985/86 academic session.


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- The Skudai campus was officiated 1<sup>st</sup> Muharam 1406 (16th September 1985) by His Royal Highness, the then Yang Di Pertuan Agong, Sultan Iskandar as Chancellor of the university
  - Nowadays, there are so many higher institutions that offer engineering be it at local universities or local twinning with foreign universities.





# Current Engineering Education


- The current engineering education system aims to produce graduates who have a strong scientific base, are innovative, technically and professionally competent, multi-skilled and well respected.
- The competencies required of engineers vary across many domains.
- The graduate may be required to exclusively perform engineering duties or play a wider role that may include business, financial or supervisory duties.

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- Engineering responsibilities may include a combination of maintenance, inspection, regulatory manufacturing, design, research and development.
  - Employers range from very small organizations with very few engineers to large organizations with many engineers.
  - It is not possible for universities to provide graduates with technical competence for all possible situations.
  - The usual approach is to provide a strong foundation in mathematics and the relevant basic sciences, upon which is built the foundation of the engineering discipline.

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- Advanced training is provided in some selective areas in the form of options or electives.
  - This produces graduates with diverse specializations to address different job requirements and also produces graduates with a strong foundation that are able to follow advances in science and engineering and align themselves accordingly.
  - Additional subject are included in the curricula to enhance specific abilities and to provide background in general areas so that they are aware of and can fit into the environment they operate in.

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- Some of these are languages, civilizations, moral and human education; management, law, safety, economics, finance innovation, creativity, entrepreneurship, professionalism and ethics.
  - Graduates also need to possess the correct attitudes necessary for soft skills.
  - The skills include creativity, communication skills interpersonal skills, ability to work in a team especially interdisciplinary teams.
  - The right attitudes include professionalism, willingness to participate concern for the environment and the need to take into account the social, ethical and moral consequences of their decisions.

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- UTM graduate attributes:
    - communication skills
    - team-working
    - problem solving
    - adaptability
    - life-long learning
    - self-esteem
    - ethics

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- Universities produce graduates with the **potential** to become engineers and it is the workplace and the established engineering professionals that convert them into engineers.






# Laws regulating the work of engineers


- Registration of Engineers Act. 1967  
(Registration of Engineers Regulations 1990 and 2015 amendments) .
- Industrial Relations Act. 1967
- Factories and Machinery Act, 1967
- Occupational Safety and Health Act. 1994



# Professional Bodies

- The three major Professional Engineering bodies to which engineers may be affiliated are:
  - I. The Board of Engineer, which is a statutory body governed by the Engineer's Act. 1967 and with which an Engineer must be registered before he can be employed or practice as an Engineer

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2. The Institution of Engineers, Malaysia, which is a learned society registered under the Society's Act. Membership is voluntary but the professional standards set by IEM for membership are accepted by BEM as qualifications for registration as a Professional Engineer and as a result most Professional Engineers are members of IEM.

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3. The Association of Consulting engineers, Malaysia, a company not for profit and limited by guarantee comprising members who are Consulting Engineers and with the objective of promoting the interest of Consulting Engineers and Consulting Engineering as a profession.