Universiti Malaysia PAHANG
Engineering • Technology • Creativity

Future Prospect for Engineering Technology

by
BADHRULHISHAM BIN ABDUL AZIZ
13th MAY 2015

Presentation Outlines

- Background
- National Agenda
- MBOT & Engineering Technology
- Initiatives at MTUN
- Challenges
- Wayforward

Learning Objectives

At the end of presentation, participants will be able to:

- Understand the Engineering Technology issues in Malaysia.
- Value the benefits of Engineering Technology to the country.
- Appreciate initiatives in Engineering Technology.
- Experience the challenges faced during the whole process.
- Visualize the Future Direction.

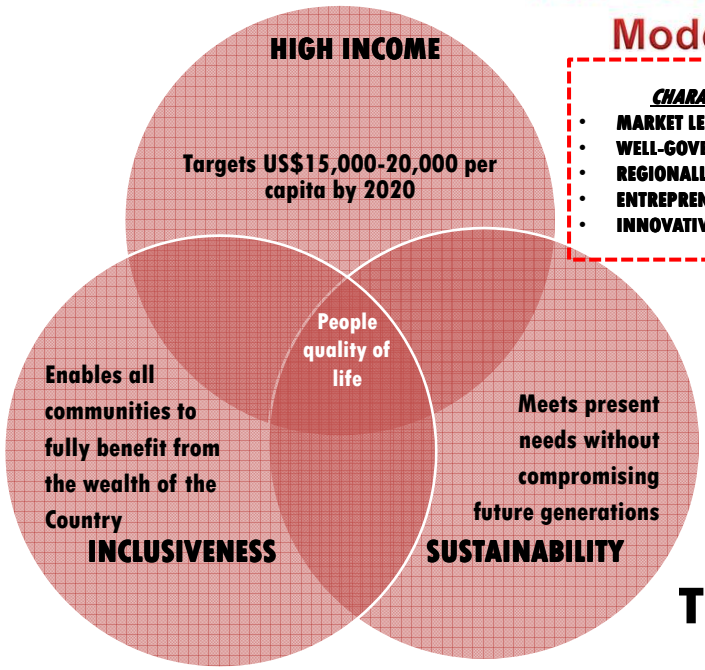
MALAYSIAN SCENARIO …

VISION 2020
NEW ECONOMIC MODEL

ROAD TO 2020

Malaysia's has introduced 4 pillars to achieve Vision 2020

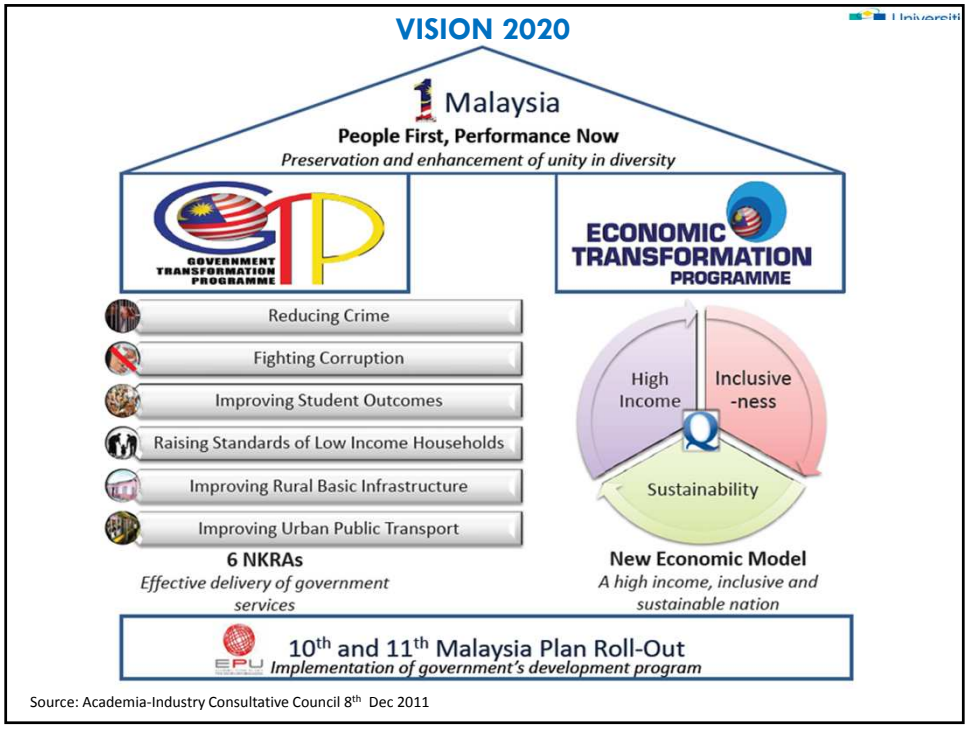
New Economy Model



CHARACTERISTICS IN 2020

- **MARKET LED**
- **WELL-GOVERNED**
- **REGIONALLY INTEGRATED**
- **ENTREPRENURIAL**
- **INNOVATIVE**

The Goals



Source: Academia-Industry Consultative Council 8th Dec 2011

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ETP focuses on:

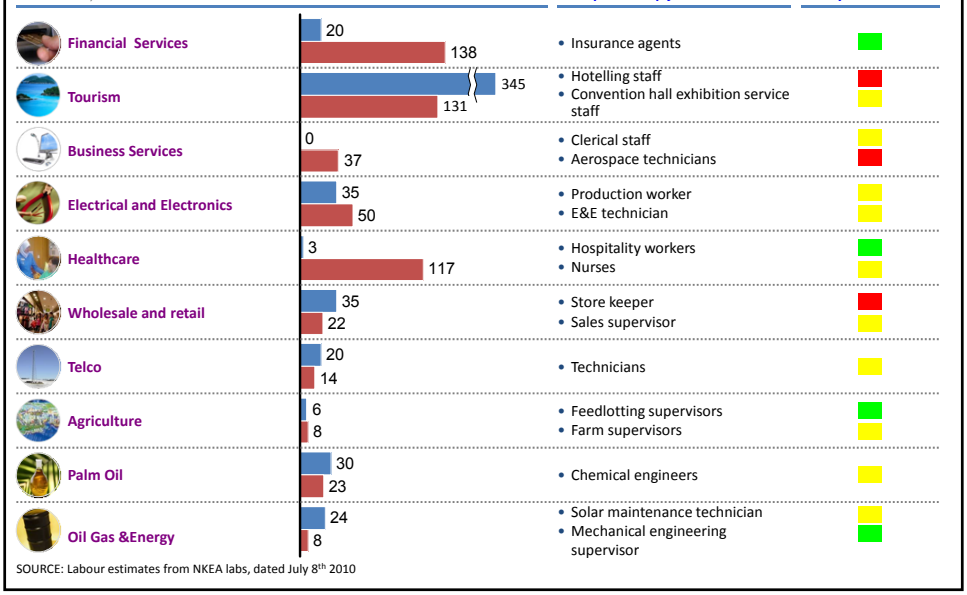
- 12 National Key Economy Areas (NKEAs)
- 131 entry point projects
- 3.3 millions new jobs by 2020
- 60% are middle & high income jobs

ETP 1 year progress:

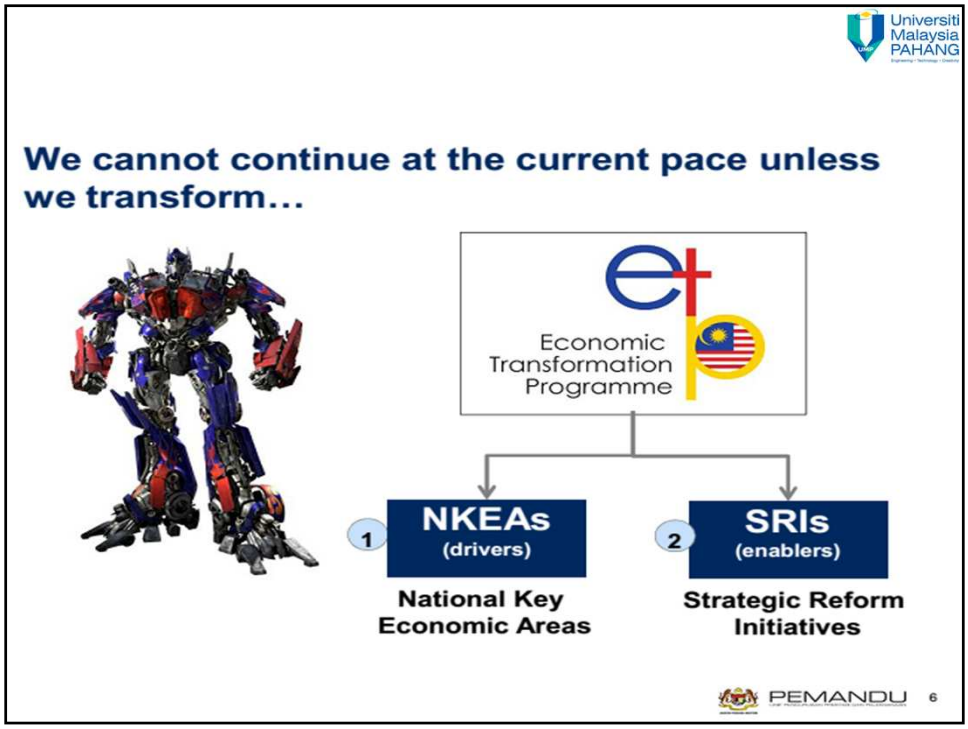
- 66% or RM10 billion worth of projects have started
- 53% of 131 entry point projects have taken off
- Private investments increased 23.4% to RM512.2 billion from RM 41.5 billion

Source: Academia-Industry Consultative Council 8th Dec 2011

Across the NKEAs, nearly 1 million jobs requiring vocational certificates or diplomas will be created over the next 10 years



SOURCE: Labour estimates from NKEA labs, dated July 8th 2010

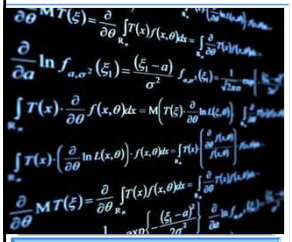
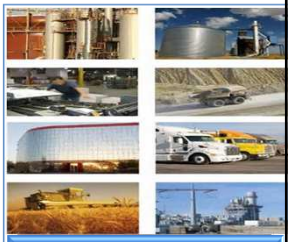


INDUSTRY SCENARIO IN MALAYSIA 1970 - 2000

FOREIGN DIRECT INVESTMENT – set up manufacturing plants.

RESEARCH AND DESIGN COMPANIES – very few.

MALAYSIAN ENGINEERING EDUCATION SCENARIO

1970 and 80s	1990s	2000 onward
		
THEORY-ORIENTED; DESIGN AND RESEARCH-based	TRANSITION	PRACTICE-ORIENTED
	Paper to Cabinet on setting up technical University colleges	Technical universities established

TEVT is critical in the 10th Malaysia Plan

Target

40%[2] skilled workforce[1] by 2020

1,031,000 more managers & professionals

1,434,000 more skilled workers

482,000 more semi-skilled workers

Policy guidelines from the 10th Malaysian Plan

Improving the Perception of TVET and Attracting More Trainees

- …a national media campaign will be developed and rolled-out…
- 69 out of 88 technical schools will be converted into vocational schools … six new vocational schools will be established by 2015 …

Upgrading and Harmonising TVET Curriculum Quality in Line with Industry Requirements

- …standardize TVET curriculum…
- Recognizing and equating various levels of Malaysian Skills Certificate with certifications issued by TVET providers
- …a Board of Technologists Malaysia will be established
- Malaysia-Japan International Institute of Technology will be established as an independent institute

Developing Highly Effective Instructors

- Highly experienced industry personnel…to become instructors …
- part-time working arrangements will be expanded
- …Centre for Instructor and Advanced Skills Training (CIAST) will be expanded..
- A new centre for instructor skills training will be developed to add a further training capacity of 800 instructors each year

Streamlining Delivery of TVET

- The current funding approach of TVET will be reviewed…provide financial assistance to students to study at Malaysian Skills Certificate Level 3
- The performance rating of TVET institutions will be utilized when making decisions for buying places…in private TVET institutions
- A total of RM 150 million will be set aside to train 20,000 school dropouts during the Plan period

[1] Skilled workforce defined as those with at least SKM 3 certificate, diploma, or degree certification semi-skilled defined as those with at least SKM 1 or 2 certification, while unskilled workers have only SPM certification. A 40% target is projected by Ministry of Human Resource, and a 50% target committed to in the 10th Malaysian Plan [2] Target based on MOHR estimates, different from 10th Malaysia Plan published targets of 50%

SOURCE: 10th Malaysia Plan

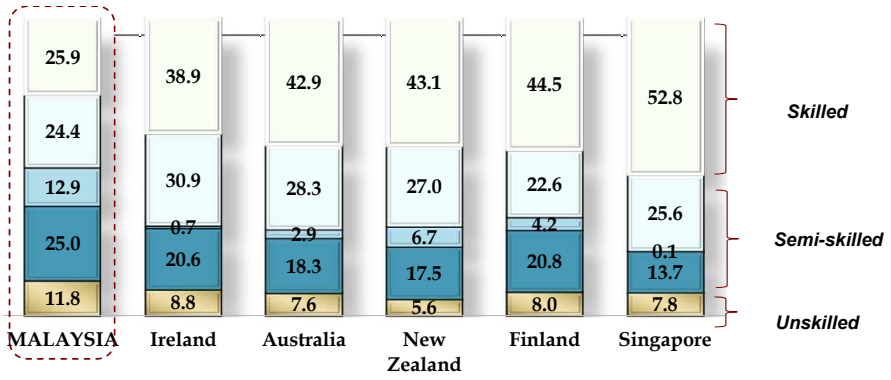
On the supply side, there is also a significant pool of students for expansion of TVET

Segment	Size Today Thousands	Segment description	Projected capture rate in 2020
Basic education dropouts	30[1]	▪ Basic education dropouts, i.e. students leaving school prior to taking SPM	50%
SPM leavers directly entering workforce	100	▪ Unskilled workers entering workforce without further qualifications, out of which 40k have no SPM credits	30%
Foreign students	0.2	▪ Foreign students coming to Malaysia for Skills Training ▪ Malaysian Skills training curriculum exported abroad	16,000
Lifelong learning for unskilled and semi-skilled workforce	8,400	▪ Upskilling of those already in workforce	20%
Higher level SKM 3 and 4	40	▪ SKM 1 and 2 holders who do not currently go on to pursue SKM 3 and 4	50%

[1] Number of students leaving the national education system could be higher, up to 80k

SOURCE: MOHR

MALAYSIA vs. DEVELOPED COUNTRIES IN TERM OF SKILL WORKERS



Ref :
Presentation Malaysian Society of Engineering Technologist (MSET) by Prof. Dr. Mazliham Mohd Su'ud, UniKL.

MALAYSIAN TECHNICAL UNIVERSITY NETWORK

FACTS AND FIGURES

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- 40,000 skilled workers needed by 2015 in oil and gas [KSM 2013];
- RM 3.7 billion budget 2013 technical and vocational [KPM];
- Australia ~ AUD 2 billion annually to provide skilled workers;

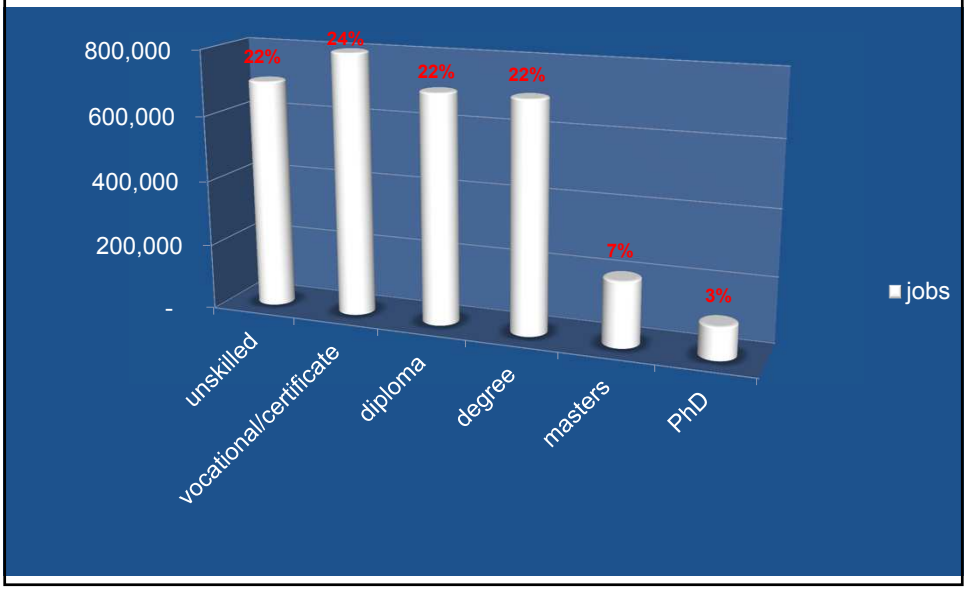
FACTS AND FIGURES

- 40% or 1.3 millions skilled worker needed by 2020 for Malaysia to be high income nation.
- In Malaysia, 10% joined vocational and technical after high school whereas in German, Finland and Austria 50 – 80%.
- By 2020, 1.3 million workers TVET; ~ 700,000 diploma holders from polytechnic and other institutions

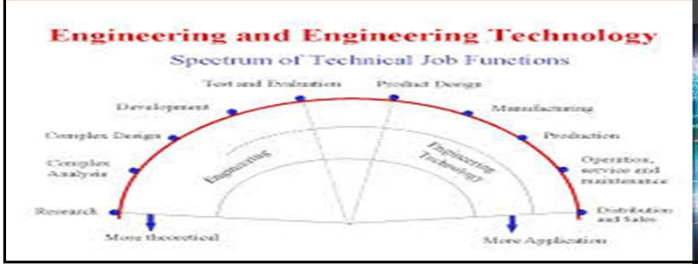
FACTS AND FIGURES

- 33% skilled workers in industrial sector by 2015 [KSU KKR]
- Development of 12 industry sectors in NKEA
- SCORE (Sarawak) : by 2030 requires 435,000 manpower; 52.2% skilled and semi-skilled; 70,000 engineering-related

3.3 millions NEW JOBS



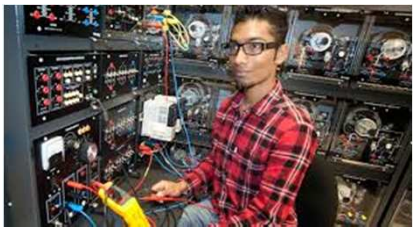
ENGINEERING VS ENGINEERING TECHNOLOGY



JOB SCOPE OF AN ENGINEER?




JOB SCOPE OF AN ENGINEERING TECHNOLOGIST?




SCIENCE, ENGINEERING & TECHNOLOGY

Science
Knowledge of **general** truths and laws

Engineering
Acquiring and Applying **scientific** knowledge to build/design/create something

Technology
The sum of all the **engineered** tools/devices/processes available

ENGINEER AND ENGINEERING TECHNOLOGIST SPECTRUM

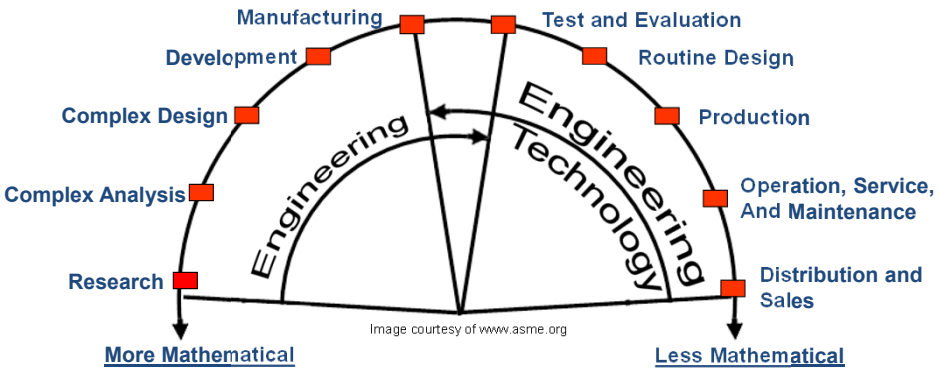
Research	Product Design	Product Development	Manufacturing	Production Testing	Technical Sale	Field Service

ENGINEER — TECHNOLOGIST

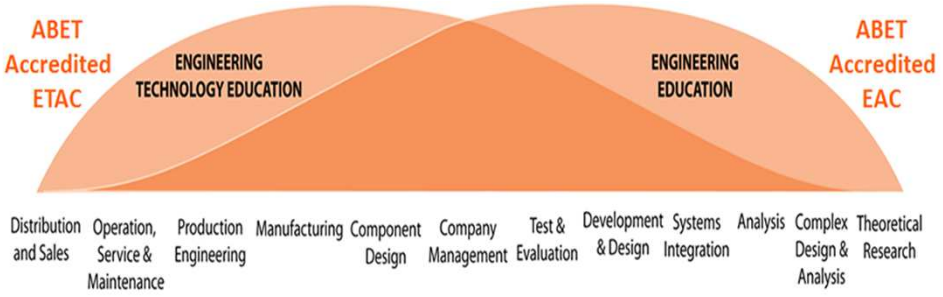
In order to distinguish between engineering and engineering technology, a technological spectrum is used to illustrate the differences. Generally, in an organization, engineers would most likely work in the design and development fields while technologists, technicians and craftsmen would be more inclined to work in manufacturing and production line. The engineers role are more towards the left of the spectrum while the technologists are more towards the right of the spectrum although the main activities of both engineers and technologist are in the center of the spectrum.

Source : Cheshier, 1998

Engineering & Engineering Technology



EDUCATION SPECTRUM



Accreditation Board for Engineering and Technology [ABET]

describes the difference between engineering and engineering technology as

"Engineering and technology are separate, but intimately related professions"

ENG VS ENG TECH [ABET]

- **Engineering undergraduate programs include more mathematics work and higher level mathematics than technology programs.**
- **Engineering undergraduate programs often focus on theory, while technology programs usually focus on application.**
- **Once they enter the workforce, engineering graduates typically spend their time planning, while engineering technology graduates spend their time making plans work.**

ENG VS ENG TECH [ABET] …. cont.

- **At ABET, engineering and engineering technology programs are evaluated and accredited by two separate accreditation commissions using two separate sets of accreditation criteria.**
- **Graduates from engineering programs are called engineers, while graduates of technology programs are often called technologists.**
- **Graduates from engineering technology programs are often hired as engineers.**

ENG vs ENG TECH

[based on Washington vs Sydney Accord]

… for Washington Accord Graduate	… for Sydney Accord Graduate
Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to defined and applied engineering procedures, processes, systems or methodologies.

RANGE OF PROBLEM SOLVING

	Attribute	Complex Problems	Broadly-defined Problems
1	Preamble	Engineering problems which cannot be resolved without in-depth engineering knowledge, much of which is at, or informed by, the forefront of the professional discipline, and have some or all of the following characteristics:	Engineering problems which cannot be pursued without a coherent and detailed knowledge of defined aspects of a professional discipline with a strong emphasis on the application of developed technology, and have the following characteristics
2	Range of conflicting requirements	Involve wide-ranging or conflicting technical, engineering and other issues	Involve a variety of factors which may impose conflicting constraints
3	Depth of analysis required	Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models	Can be solved by application of well-proven analysis techniques
4	Depth of knowledge required	Requires research-based knowledge much of which is at, or informed by, the forefront of the professional discipline and which allows a fundamentals-based, first principles analytical approach	Requires a detailed knowledge of principles and applied procedures and methodologies in defined aspects of a professional discipline with a strong emphasis on the application of developed technology and the attainment of know-how, often within a multidisciplinary engineering environment
5	Familiarity of issues	Involve infrequently encountered issues	Belong to families of familiar problems which are solved in well-accepted ways
6	Extent of applicable codes	Are outside problems encompassed by standards and codes of practice for professional engineering	May be partially outside those encompassed by standards or codes of practice
7	Extent of stakeholder involvement and level of conflicting requirements	Involve diverse groups of stakeholders with widely varying needs	Involve several groups of stakeholders with differing and occasionally conflicting needs
8	Consequences	Have significant consequences in a range of contexts	Have consequences which are important locally, but may extend more widely
9	Interdependence	Are high level problems including many component parts or sub-problems	Are parts of, or systems within complex engineering problems

RANGE OF ENG. ACTIVITIES

	Attribute	Complex Activities	Broadly-defined Activities
1	Preamble	**Complex activities** means (*engineering*) activities or projects that have some or all of the following characteristics:	**Broadly defined activities** means (*engineering*) activities or projects that have some or all of the following characteristics:
2	Range of resources	Involve the use of diverse resources (and for this purpose resources includes people, money, equipment, materials, information and technologies)	Involve a variety of resources (and for this purposes resources includes people, money, equipment, materials, information and technologies)
3	Level of interactions	Require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues,	Require resolution of occasional interactions between technical, engineering and other issues, of which few are conflicting
4	Innovation	Involve creative use of engineering principles and research-based knowledge in novel ways.	Involve the use of new materials, techniques or processes in non-standard ways
5	Consequences to society and the environment	Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation	Have reasonably predictable consequences that are most important locally, but may extend more widely
6	Familiarity	Can extend beyond previous experiences by applying principles-based approaches	Require a knowledge of normal operating procedures and processes

KNOWLEDGE PROFILE

A Washington Accord programme provides:	**A Sydney Accord programme** provides:
• A systematic, theory-based understanding of the **natural sciences** applicable to the discipline (e.g. calculus-based physics)	• A systematic, theory-based understanding of the **natural sciences** applicable to the sub-discipline
• Conceptually-based **mathematics**, numerical analysis, statistics and formal aspects of computer and information science to support analysis and modelling applicable to the discipline	• Conceptually-based **mathematics**, numerical analysis, statistics and aspects of computer and information science to support analysis and use of models applicable to the sub-discipline
• A systematic, theory-based formulation of **engineering fundamentals** required in the engineering discipline	• A systematic , theory-based formulation of **engineering fundamentals** required in an accepted sub-discipline
• engineering **specialist knowledge** that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.	• engineering **specialist knowledge** that provides theoretical frameworks and bodies of knowledge for an accepted sub-discipline
• knowledge that supports **engineering design** in a practice area	• knowledge that supports **engineering design** using the technologies of a practice area
• knowledge of **engineering practice** (technology) in the practice areas in the engineering discipline	• knowledge of **engineering technologies** applicable in the sub-discipline
• **comprehension of** the role of engineering in society and identified issues in engineering practice in the discipline: ethics and the professional responsibility of an engineer to public safety; the impacts of engineering activity: economic, social, cultural, environmental and sustainability;	• **comprehension of** the role of technology in society and identified issues in applying engineering technology: ethics and impacts: economic, social, environmental and sustainability
• Engagement with selected knowledge in the **research literature** of the discipline	• engagement with the **technological literature** of the discipline
A programme that builds this type of knowledge and develops the attributes listed below is typically achieved in 4 to 5 years of study, depending on the level of students at entry.	A programme that builds this type of knowledge and develops the attributes listed below is typically achieved in 3 to 4 years of study, depending on the level of students at entry.

GRADUATE ATTRIBUTE PROFILES

		Differentiating Characteristic	... for Washington Accord Graduate	... for Sydney Accord Graduate
1.	**Engineering Knowledge**	Breadth and depth of education and type of knowledge, both theoretical and practical	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to defined and applied engineering procedures, processes, systems or methodologies.
2.	**Problem Analysis**	Complexity of analysis	Identify, formulate, research literature and analyse *complex* engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.	Identify, formulate, research literature and analyse *broadly-defined* engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation.
3.	**Design/ development of solutions**	Breadth and uniqueness of engineering problems i.e. the extent to which problems are original and to which solutions have previously been identified or codified	Design solutions for *complex* engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.	Design solutions for *broadly- defined* engineering technology problems and *contribute to* the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
4.	**Investigation**	Breadth and depth of investigation and experimentation	Conduct investigations of *complex* problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.	Conduct investigations of *broadly-defined* problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.
5.	**Modern Tool Usage**	Level of understanding of the appropriateness of the tool	Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to *complex* engineering activities, with an understanding of the limitations.	Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to *broadly-defined* engineering activities, with an understanding of the limitations.

GRADUATE ATTRIBUTE PROFILES

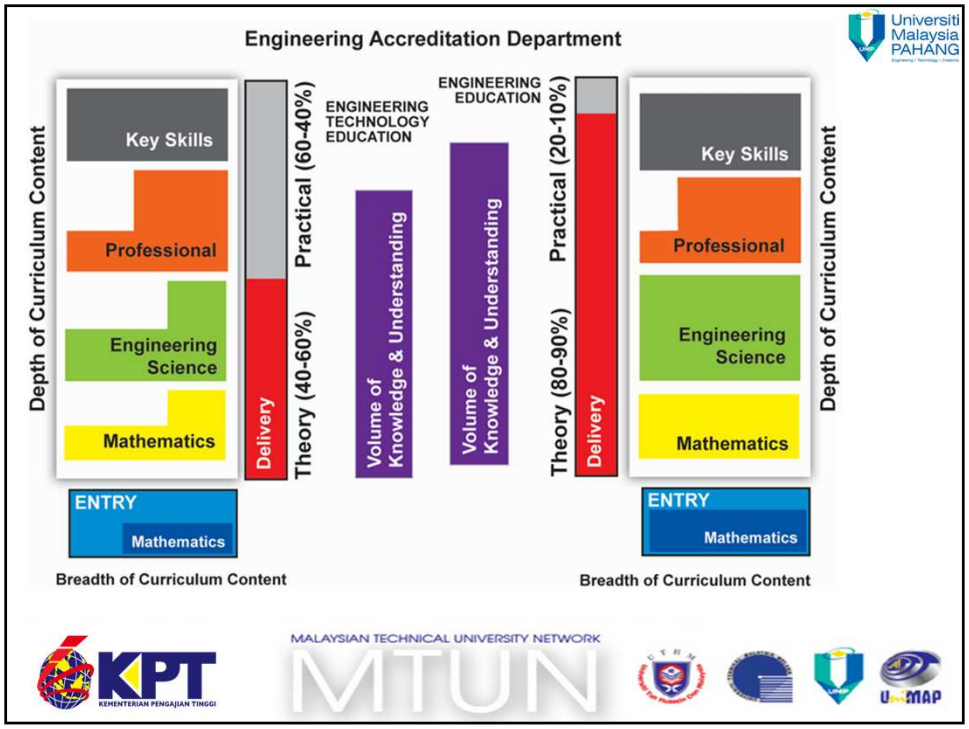
		Differentiating Characteristic	... for Washington Accord Graduate	... for Sydney Accord Graduate
6.	The Engineer and Society	Level of knowledge and responsibility	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.	Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice.
7.	Environment and Sustainability	Type of solutions.	Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.	Understand the impact of engineering technology solutions in societal societal and environmental context and demonstrate knowledge of and need for sustainable development.
8.	Ethics	Understanding and level of practice	Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.	Understand and commit to professional ethics and responsibilities and norms of engineering technology practice.
9.	Individual and Team work	Role in and diversity of team	Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.	Function effectively as an individual, and as a member or leader in diverse technical teams.
10.	Communication	Level of communication according to type of activities performed	Communicate effectively on *complex* engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	Communicate effectively on *broadly-defined* engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
11.	Project Management and Finance	Level of management required for differing types of activity	Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments
12.	Life long learning	Preparation for and depth of continuing learning.	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

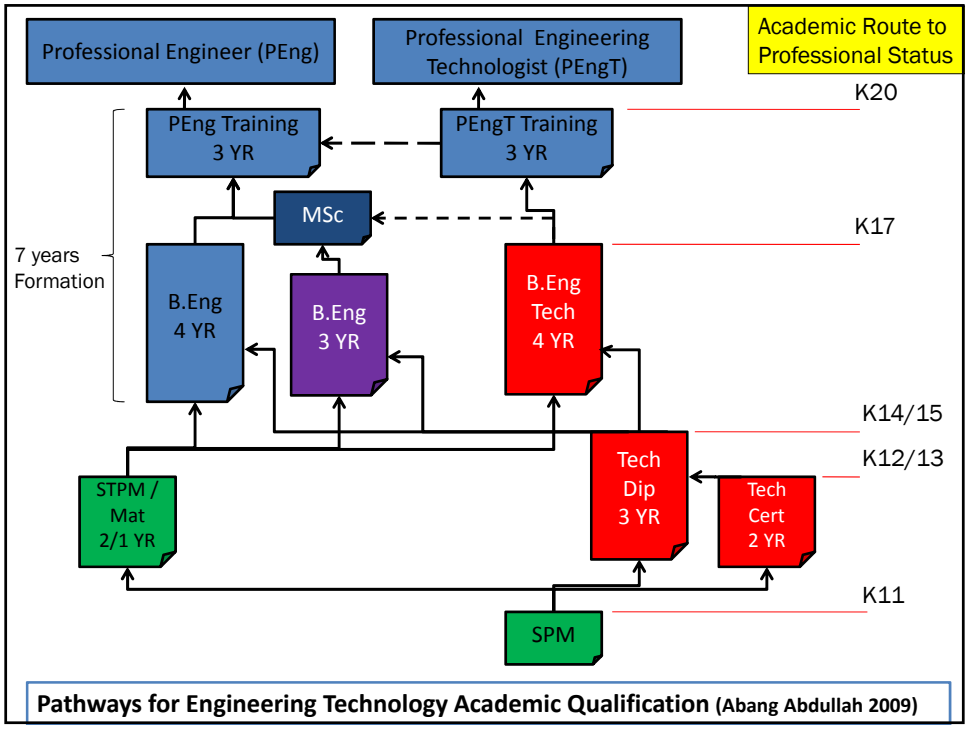
PROFESSIONAL COMPETENCY PROFILES

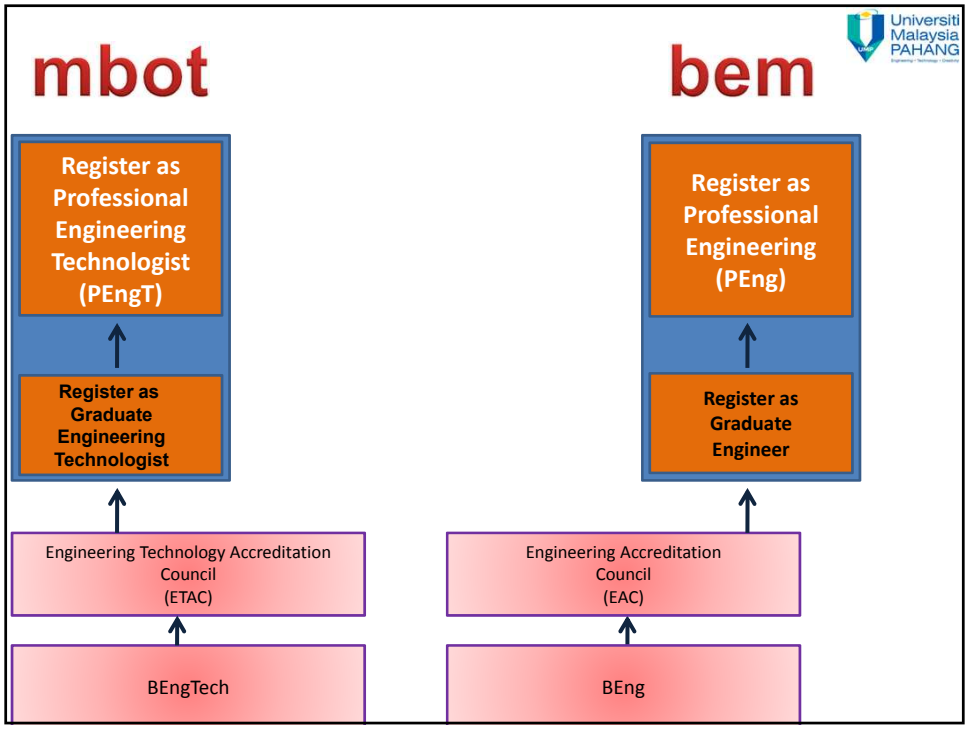
		Differentiating Characteristic	Professional Engineer	Engineering Technologist
1.	**Comprehend and apply universal knowledge**	Breadth and depth of education and type of knowledge	Comprehend and apply advanced knowledge of the widely-applied principles underpinning good practice	Comprehend and apply the knowledge embodied in widely accepted and applied procedures, processes, systems or methodologies
2.	**Comprehend and apply local knowledge**	Type of local knowledge	Comprehend and apply advanced knowledge of the widely-applied principles underpinning good practice specific to the jurisdiction in which he/she practices.	Comprehend and apply the knowledge embodied procedures, processes, systems or methodologies that is specific to the jurisdiction in which he/she practices.
3.	**Problem analysis**	Complexity of analysis	Define, investigate and analyse complex problems	Identify, clarify, and analyse broadly-defined problems
4.	**Design and development of solutions**	Nature of the problem and uniqueness of the solution	Design or develop solutions to complex problems	Design or develop solutions to broadly-defined problems
5.	**Evaluation**	Type of activity	Evaluate the outcomes and impacts of complex activities	Evaluate the outcomes and impacts of broadly defined activities
6.	**Protection of society**	Types of activity and responsibility to public	Recognise the reasonably foreseeable social, cultural and environmental effects of complex activities generally, and have regard to the need for sustainability; recognise that the protection of society is the highest priority	Recognise the reasonably foreseeable social, cultural and environmental effects of broadly-defined activities generally, and have regard to the need for sustainability; take responsibility in all these activities to avoid putting the public at risk.
7.	**Legal and regulatory**	No differentiation in this characteristic	Meet all legal and regulatory requirements and protect public health and safety in the course of his or her activities	Meet all legal and regulatory requirements and protect public health and safety in the course of his or her activities

PROFESSIONAL COMPETENCY PROFILES

		Differentiating Characteristic	Professional Engineer	Engineering Technologist
8.	**Ethics**	No differentiation in this characteristic	Conduct his or her activities ethically	Conduct his or her activities ethically
9.	**Manage engineering activities**	Types of activity	Manage part or all of one or more complex activities	Manage part or all of one or more broadly-defined activities
10.	**Communication**	No differentiation in this characteristic	Communicate clearly with others in the course of his or her activities	Communicate clearly with others in the course of his or her activities
11.	**Lifelong learning**	Preparation for and depth of continuing learning.	Undertake CPD activities sufficient to maintain and extend his or her competence	Undertake CPD activities sufficient to maintain and extend his or her competence
12.	**Judgement**	Level of developed knowledge, and ability and judgement in relation to type of activity	Recognize complexity and assess alternatives in light of competing requirements and incomplete knowledge. Exercise sound judgement in the course of his or her complex activities	Choose appropriate technologies to deal with broadly defined problems. Exercise sound judgement in the course of his or her broadly-defined activities
13.	**Responsibility for decisions**	Type of activity for which responsibility is taken	Be responsible for making decisions on part or all of complex activities	Be responsible for making decisions on part or all of one or more broadly defined activities




Professional Engineer (PEng)
Professional Engineering Technologist (PEngT)
Academic Route to Professional Status
K20
PEng Training 3 YR
PEngT Training 3 YR
MSc
K17
7 years Formation
B.Eng 4 YR
B.Eng 3 YR
B.Eng Tech 4 YR
K14/15
K12/13
STPM / Mat 2/1 YR
Tech Dip 3 YR
Tech Cert 2 YR
K11
SPM
Pathways for Engineering Technology Academic Qualification (Abang Abdullah 2009)


mbot
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Universiti Malaysia PAHANG
Register as Professional Engineering Technologist (PEngT)
Register as Graduate Engineering Technologist
Register as Professional Engineering (PEng)
Register as Graduate Engineer
Engineering Technology Accreditation Council (ETAC)
Engineering Accreditation Council (EAC)
BEngTech
BEng

MBOT will enhance the career path of TEVT graduates

MQF Levels	Skills (SAC – Technical & Non Technical)	Vocational and Technical (TAC – Poly, Community College, Dublin Accord)	Higher Learning Institutions (ETAC – Sydney Accord)	Designation
8	NA	NA	Doctorate	Principal Technologist / Executive
7	NA	NA	Masters	Senior Technologist / Executive
6	NA	NA	Bachelors	Technologist / Executive
5	Advanced Diploma	Advanced Diploma	Advanced Diploma	Senior Technician
4	Diploma	Diploma	Diploma	Technician
3	Skills Certificate 3	Vocational & Technical Certificate		Junior Technician
2	Skills Certificate 2			Senior Operator
1	Skills Certificate 1			Operator

New Issue in Engineering Technology

- About 80% of working field in engineering needs engineering technologist
- Out of 100,000 engineers, 80,000 doing engineering technologist work
- Government aims to produce 60,000 Technologists by 2020
- MTUN is responsible to produce Technologists

The Establishment of Malaysia Board of Technologists (MBOT)

CURRENT STATUS ON TECHNOLOGIST AND TECHNICIANS 2014 BILL

- PASSED IN DEWAN RAKYAT → 2 APRIL 2015
- PASSED IN DEWAN NEGARA → 23 APRIL 2015
- GAZETTED 30 DAYS FROM 23 APRIL 2015

Policy decisions on the establishment of MBOT

10th Malaysia Plan

Accelerate the recognition of TEVT certifications through the establishment of MBOT

Cabinet Committee on HCD (JKMPMI) No.3/2010 (20 August 2010)

Recommend the establishment of MBOT to recognise and certify technologist as a profession to increase the pool of skilled workforce required to attain a high income economy

Cabinet Decision (29 September 2010)

Endorse the decision of Cabinet Committee on HCD to establish MBOT

Cabinet Committee on HCD (JKMPMI) No.1/2011 (8 March 2011)

Expedite the establishment of MBOT to recognise TEVT graduates

Key Functions of MBOT

Accredit technology and Technical Programme in IHL / TEVT Institution

Regulate the conduct and ethics of technologists and technicians

Promote education and training (professional programme)

Assess and approve / reject applications for registration

Establish accreditation councils (eg. ETAC and SAC)

To elevate the standing and recognition of Technologists and Technicians

- Technologists and technicians are currently not recognised and certified as professionals by any professional body
- Technologists and technicians will be accorded international recognition through membership of MBOT in various international accords
- Institutions will be motivated to offer technology and TEVT programmes

To increase the pool of skilled workforce required to attain a high income economy

- Only 28% of the total workforce is employed in the higher skilled jobs category reflecting a huge pool of unskilled workforce
- Potential pool of 100,000 students (22% of total students enter the workforce after SPM) who are technically inclined
- Of the total 3.3 million jobs to be created under ETP by 2020, 700,000 jobs require skilled workforce with diploma in TEVT

RATIONALE FOR MBOT

To improve public perception of TEVT and attract more students

- On average, 10% of students enroll in TEVT institutions annually (low compared to 44% in OECD countries) reflecting the unattractiveness of TEVT
- 38 diploma / advanced diploma engineering and technology courses offered by 30 polytechnics will be accredited
- 30% of the 5,639 skills programmes that are technical-based will be accredited
- More students will be motivated to enroll in TEVT

To protect public safety and health through...

- Quality assurance (qualification, accreditation, training)
- License professional technologists / certified technicians to offer professional technology and technical services
- Regulate code of conduct and ethics of technologists and technicians

MBOT will solves these long overdue problems...

MBOT WILL PRODUCE THESE OUTPUTS…

TEVT

- More than **300,000** technicians will be registered

Skills

- **5,639** accredited programmes (certificate / diploma / advanced diploma) will be recognised

Engineering Technology

- **44** new enginering technology programmes and **124** existing ones will be accredited
- **384,300** new technologists will be registered by 2020

49

TECHNOLOGISTS AND TECHNICIANS BILL 2014

2. In this Act, unless the context otherwise requires —

- **"technologist" means a person who involves in the application and adaptation of technology that requires principles, methods and techniques appropriate to the field of technology with the exception of those who are already registered under any other Acts as in appendix; (BEM, BOA, BQSM,..)**
- **"Professional Technologist" means a person registered under subsection 19(4);**
- **"Graduate Technologist" means a person registered under subsection 19(2);**

PROFESSIONAL TECHNOLOGIST IN THE BILL

17. No person shall, unless he is a Professional Technologist –

(a) **approve and certify the manner or conduct of technology services to be carried out;**

be entitled to describe himself or hold himself out under any name, style or title –

bearing the words "Professional Technologist" or the equivalent in any other language;

bearing any other word whatsoever in any language which may reasonably be construed to imply that he is a Professional Technologist;

using the abbreviated title "Ts." for Professional Technologist before his name with the approval of the Board; or

using the abbreviation "P.Tech" for Professional Technologist and his specialisation after his name with the approval of the Board;

Registration of Graduate Technologist and Professional Technologist

19. (1) A person who holds a degree in technology or a technical-related programme which is recognised by the Board may apply to be registered as a Graduate Technologist upon payment of the prescribed fee.

(2) Upon application made under subsection (1), and based on the criteria as may be determined by the Board, the Board may approve the application to be registered as a Graduate Technologist.

(3) A Graduate Technologist registered under subsection (2) who has –

- **obtained the practical experience as may be determined by the Board;**
- **paid the prescribed fee; and**
- **complied with all the criteria to be determined by the Board,**

may apply to be registered as a Professional Technologist.

(4) Upon application made under subsection (3), and based on the criteria as may be determined by the Board, the Board may approve the registration of a Graduate Technologist as a Professional Technologist.

MALAYSIAN TECHNICAL UNIVERSITY NETWORK

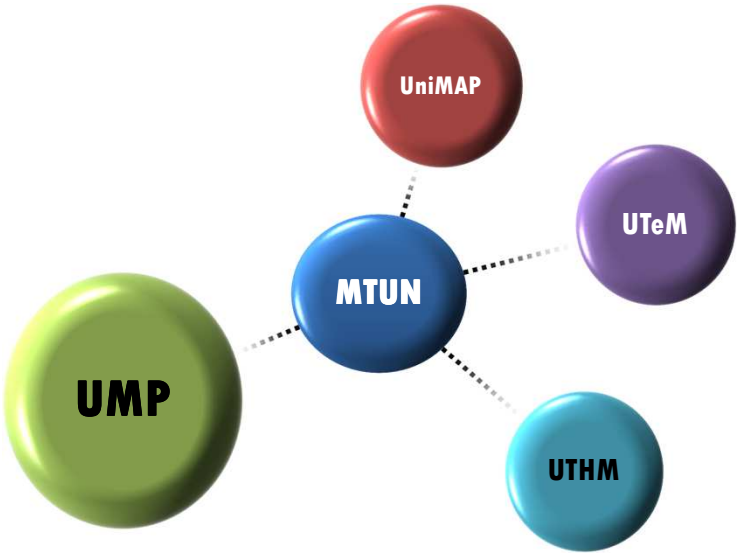
MTUN

Universiti Malaysia PAHANG

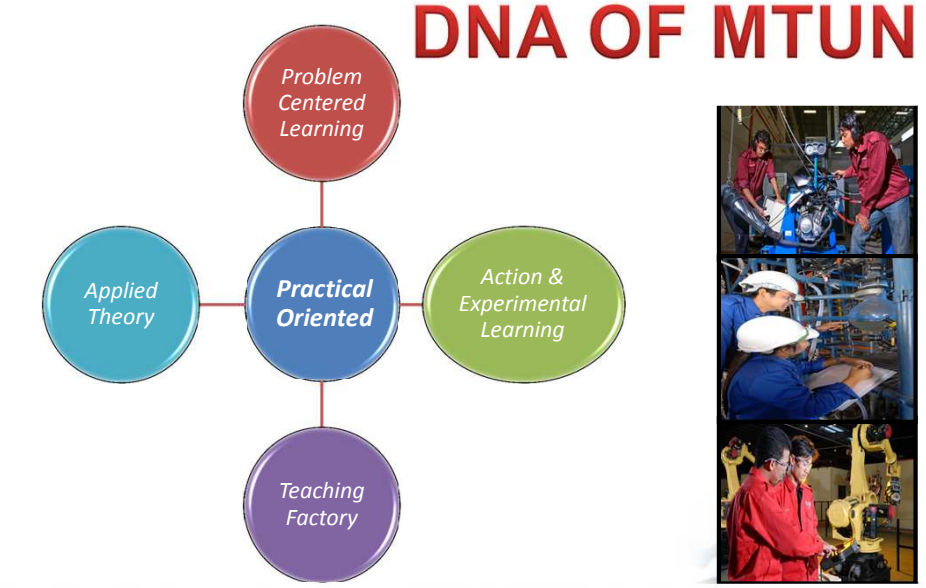
ENGINEERING TECHNOLOGY IN MTUN

Malaysian Technical University Network (MTUN)

Universiti Malaysia PAHANG



DNA OF MTUN



KPT KEMENTERIAN PENGAJIAN TINGGI

MALAYSIAN TECHNICAL UNIVERSITY NETWORK MTUN

Universiti Malaysia PAHANG

Implementation for Engineering Technology Program at MTUN

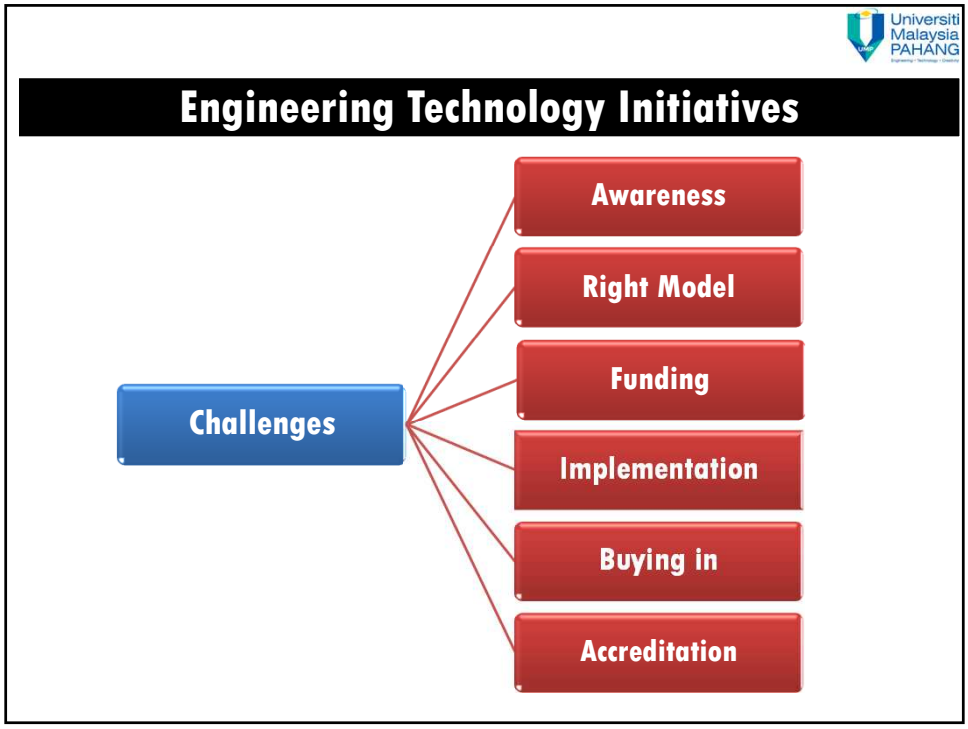
ESTIMATED BUDGET FOR ENGINEERING TECHNOLOGY PROGRAM IN MTUN

2013-2015

YEAR	TOTAL [RM MILLIONS]
2013	272
2014	285
2015	365
TOTAL	922

45 PROGRAMS
&
~ 7000 STUDENTS

Challenges and Future of ENGINEERING TECHNOLOGY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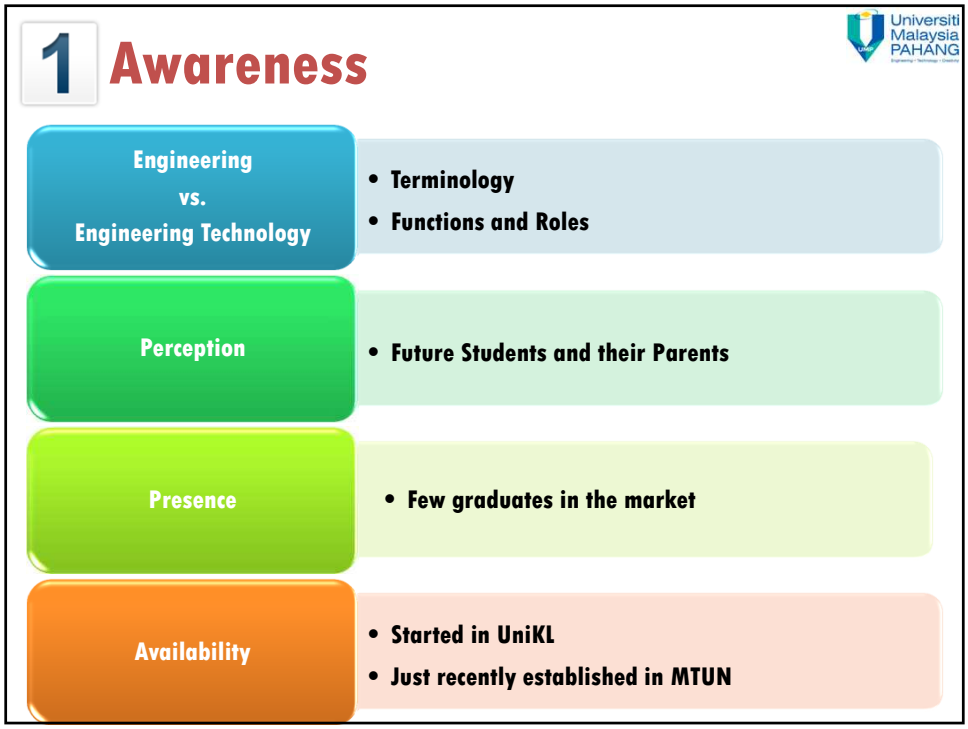
Engineering Technology Initiatives
Challenges
Awareness
Right Model
Funding
Implementation
Buying in
Accreditation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1 Awareness
Engineering vs. Engineering Technology
• Terminology
• Functions and Roles
Perception
• Future Students and their Parents
Presence
• Few graduates in the market
Availability
• Started in UniKL
• Just recently established in MTUN

2 The Right Model

COUNTRY	BOARD	SCOPE	ACCORD
Malaysia	Board of Engineers Malaysia (BEM)	Engineering Programme	Washington
UK	Engineering Council (EC)	Engineering, Technology, Construction & Build Environment	Washington Sydney Dublin
Canada	Canadian Council of Technicians & Technologists (CCTT)	Bioscience, Building, Chemical, Civil, Electrical, Electronic, Forestry, Geomatics, Instrumentation, Industrial, Information Technology, Mechanical, Petroleum & Geosciences	Sydney Dublin
	Engineers Canada	All Engineering fields	Washington
USA	Accreditation Board for Engineering and Technology (ABET)	Education in Applied Science, Computing, Engineering and Technology	Washington Sydney
Australia	Institution of Engineers Australia (IEA)	All Engineering fields	Sydney Washington
Ireland	Engineers Ireland	All Engineering fields and ICT	Washington Sydney Dublin

3 Funding

Univ has to bear the cost for	Government Fund
• Curriculum development • Administrative works	• Limited funding • Delay or uncertain

4 Implementation

Programs	• Searching for suitable programs • Dealing with host institutions
Delivery	• Curriculum • Teaching materials
Manpower	• Lecturers and Technicians • Industrial Experience
Students	• Promotion, Application and Selection

5 Buying In

STAKEHOLDERS

society

industry

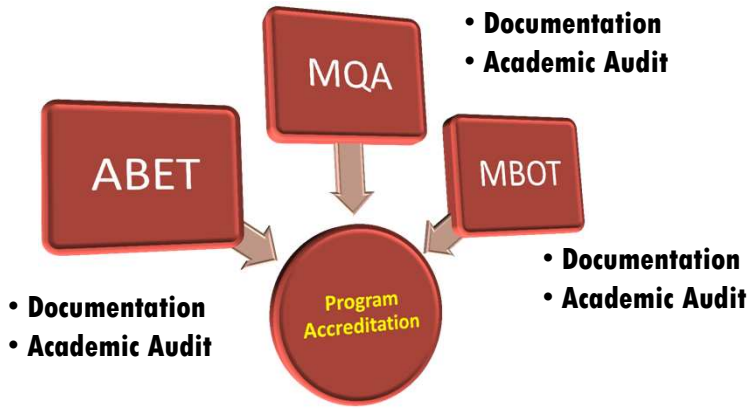
students

SHAREHOLDERS

government

ministry

6 Accreditation



WAYFORWARD

MALAYSIA 2020

ENGINEERING TECHNOLOGY

RECOGNITION & ACCEPTANCE

BENCH MARKING

FOCUS

QUALITY


Thank You