

# Outcome-Based Approach to Engineering Education

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## OUTCOMES OF THIS PRESENTATION

After this presentation, the participants will:

- ✓ Know what is EAC and its functions
- ✓ Be aware of what EAC is looking for during an accreditation exercise/visit
- ✓ Know OBE and its importance
- ✓ Be aware of his/her roles and contributions to the OBE business and EAC visit

# Contents

- ✓ What is EAC?
- ✓ Why Need Accreditation?
- ✓ EAC Accreditation Criteria
- ✓ Deficiencies of Traditional Education
- ✓ Outcome Based Education (OBE)
- ✓ Role of Lecturers
- ✓ Roles of Students
- ✓ Q & A

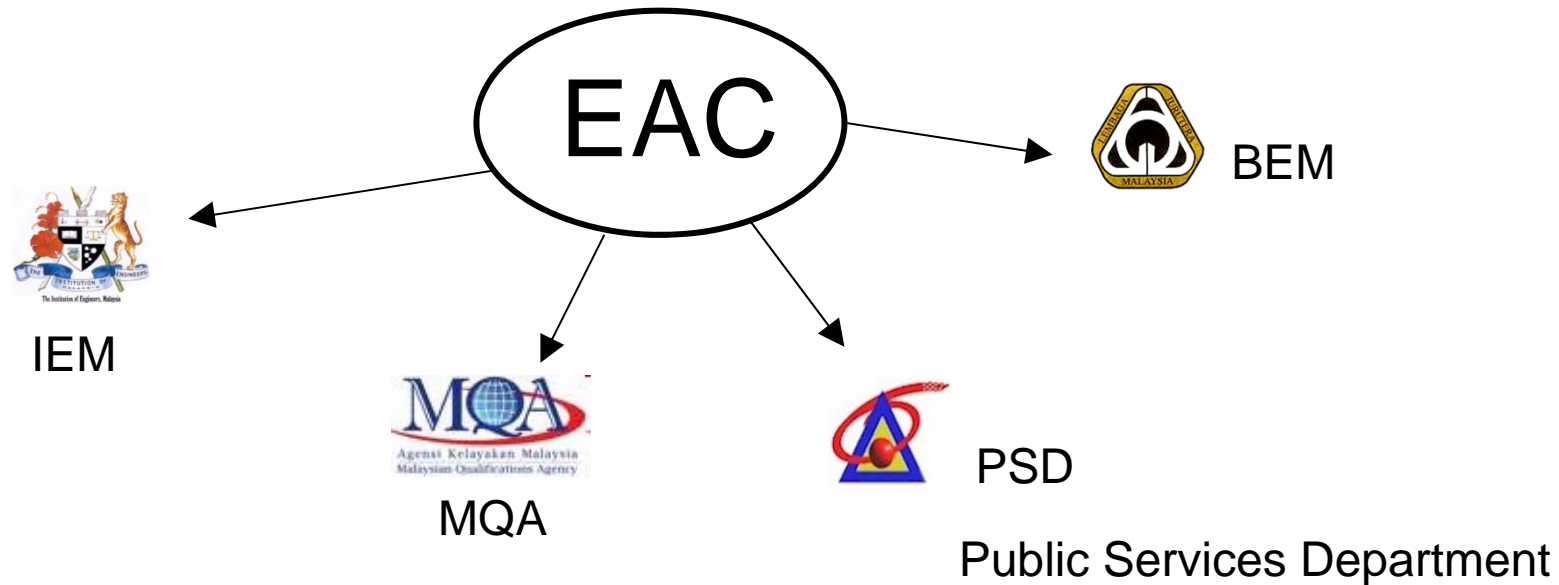
# What Is EAC?

## Engineering Accreditation Council

- Formed in 2000

Previous accreditation for engineering programs :

PSD (1957) → IEM (1959) → BEM (1967) → LAN(1996) / MQA(2007)--→ EAC



# What Is EAC?

## Engineering Accreditation Council

- Formulates and updates accreditation policies and criteria
- Approves guidelines and operating procedures
- Oversees operational arrangements and appoints evaluation panel
- Receives evaluation reports and decides on accreditation
- Responds to complaints, appeals or any proposals for change
- Oversees development and operation of accreditation and mutual recognition agreement with other countries
- Fosters the dissemination of developments and best practices in engineering education

# Why Need Accreditation?

## Governed by *the REGISTRATION OF ENGINEERS ACT 1967 (Revised 2002)*

- No person is allowed to practice unless he is a professional engineer
  - Professional engineer may use “Ir” before his name or “PEng” after his name
- Graduate engineers must register before taking up employment as an engineer

# Why Need Accreditation?

Those who have successfully completed an accredited engineering programme are **Graduate engineers**

**Professional Engineer** - a **graduate engineer** who has obtained the prescribed practical experience, passed the Professional Assessment Examination, and satisfied all other requirements of the Board of Engineers (BEM)

# Why Need Accreditation?

## ***International Mobility (Washington Accord)***

- **The Washington Accord (WA):** Agreement that establishes equivalence of other countries' accredited professional engineering programs.
- Accredited Engineering Graduates are recognized by other signatory countries - *Possible employment as engineers in those countries without further examinations.*



# Why Need Accreditation?

## *International Mobility (Washington Accord)*

- Established in 1989, as of 2007, the following countries are full members of WA: Australia, Canada, the Republic of Ireland, Hong Kong, Japan, New Zealand, Singapore, South Africa, South Korea, Taiwan, the UK and the USA.
- The following countries are provisional members of the WA and may become a full member in the future: Germany, India, **Malaysia (since 2003)**, Russia, Sri Lanka.

# Why Need Accreditation?

Our last accreditation was in 2003 for 5-year programme

Next accreditation visit will be in July 2009

- for intakes of 2005 & onwards

Our programme has been accredited before,  
so what's the big deal?

**Programmes to be accredited in 2009  
will have to be based on OBE!**

**NO OBE = NO ACCREDITATION**

# EAC Accreditation Criteria

- ✓ Academic Curriculum
- ✓ **Students**
- ✓ **Academic and Supporting Staff**
- ✓ Facilities
- ✓ Quality Management System

# EAC Accreditation Criteria

- **Academic Staff**
  - ✓ Academic qualifications
  - ✓ Professional qualification, experience & development
  - ✓ Research/publication/consultancy
  - ✓ Industrial involvement
  - ✓ Teaching load/contact hours
  - ✓ Motivation and enthusiasm
  - ✓ Use of lecturers from industry/public bodies
  - ✓ **Aware and practice of OBE**

# Deficiencies of Traditional Education

- Provides students with a learning environment with little attention to whether or not students ever learn the material.
- Students are given grades and rankings compared to each other – students become **exam oriented** or **CGPA driven**.
- Graduates are not completely prepared for the workforce.
- Lack of emphasis on soft skills needed in jobs e.g. communication skills, interpersonal skills, analytical skills, etc.

# Outcome-Based Education

- OBE is an educational process that focuses on what students **can do** or the **qualities** they should develop after they are taught.
- Both structures and curricula are designed to achieve those capabilities or qualities.
- Discourages traditional education approaches based on direct instruction of facts and standard methods.
- It requires that the students demonstrate that they have learnt the required skills and content.

# Outcome-Based Education

## Employers Rating of Skills/Qualities – 2002

# Outcome-Based Education

**OBE addresses the following key questions:**

- **What** do we want the students to have or be able to do?
- **How** best can we help students achieve it?
- **How** will we know whether the students have achieved it?
- **How** do we close the loop for further improvement (Continuous Quality Improvement (CQI))?



# Outcome-Based Education

## What are expected of Students under OBE?

- Students are expected to be able to do more challenging tasks other than memorize and reproduce what was taught.
- Students should be able to: write project proposals, complete projects, analyze case studies, give case presentations, show their abilities to think, question, research, and make decisions based on the findings.
- Be more creative, able to analyze and synthesize information.
- Able to plan and organize tasks, able to work in a team as a community or in entrepreneurial service teams to propose solutions to problems and market their solutions

# Outcome-Based Education

## Criteria for International Recognition

In term of Problem Analysis ....

Washington Accord (Engineers)	Sydney Accord (Technologists)	Dublin Accord (Technicians)
Identify, formulate, research literature and solve <i>complex</i> engineering problems reaching substantiated conclusions using <i>first principles of mathematics and engineering sciences</i>	Identify, formulate, research literature and solve <i>broadly-defined</i> engineering problems reaching substantiated conclusions using <i>analytical tools appropriate to their discipline or area of specialisation</i>	Identify and solve <i>well-defined</i> engineering problems reaching substantiated conclusions using <i>codified methods of analysis specific to their field of activity</i>

# Outcome-Based Education

## Criteria for International Recognition

In term of Depth of Analysis required....

<b>Complex Problems (Engineers)</b>	<b>Broadly-defined Problems (Technologists)</b>	<b>Well-defined Problems (Technicians)</b>
Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models	Can be solved by well-proven analysis techniques	Can be solved in standardized ways

# Outcome-Based Education

## Benefits of OBE:

- More directed & coherent curriculum.
- Graduates will be more “relevant” to industry & other stakeholders (more well grounded graduates).
- Continuous Quality Improvement (CQI) is in place.

# Outcome-Based Education

## Expected Changes to Implement OBE

**Course Content** - Reviewing course content to suit specified Learning Outcomes, industrial needs, job specifications, professional body requirement (accreditation), own niche, etc.

**Teaching-Learning Methods** - Introducing innovative/flexible teaching methods/delivery tools to develop PEO and PO in students/graduates.

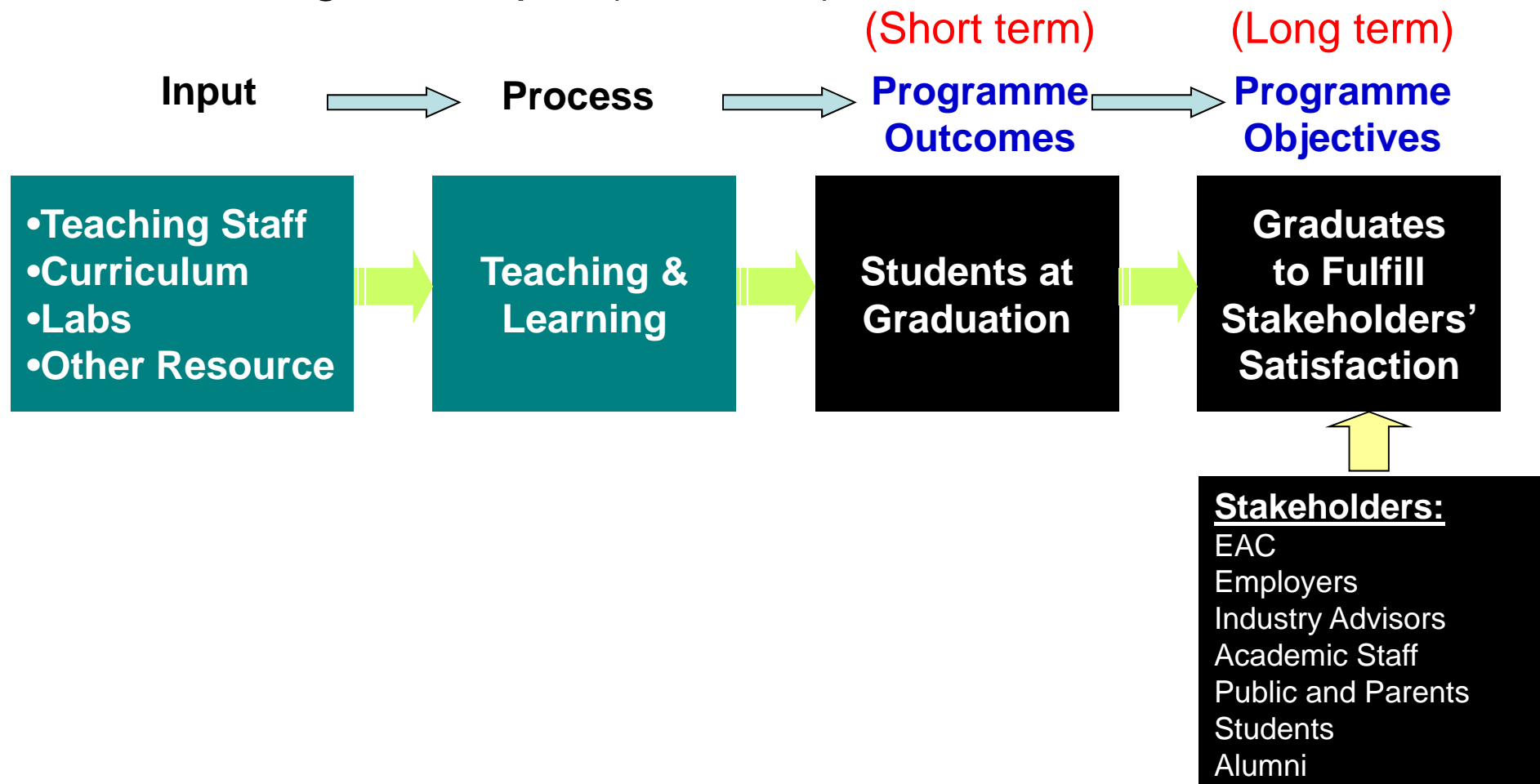
**Assessment & Evaluation Tools** - Introducing variety of assessment and evaluation tools to measure the achievement of PEO and PO.

**Data & Evidence Collection** - Collecting evidences of process involved and the achievement of the PEO and PO.

**Continuous Quality Improvement** - Closing the loop.

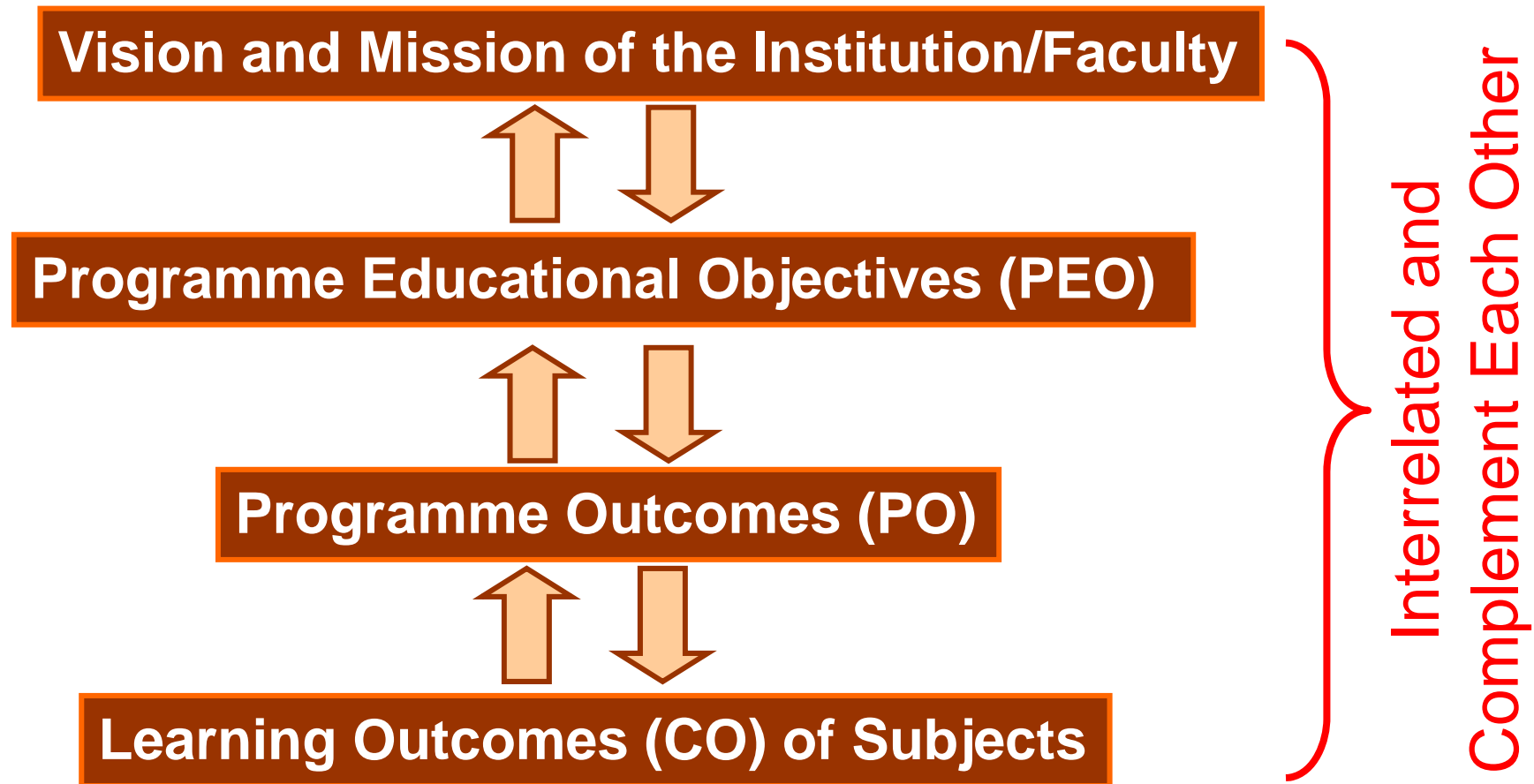
# Outcome-Based Education

- Shifting from measuring input and process to include measuring the output (outcome).



# Outcome-Based Education

## A Model Hierarchy



# Outcome-Based Education

## **Vision of the University**

To be a premier university that propagates the generation and dissemination of knowledge in cutting edge technologies

## **Mission of the University**

1. To deliver quality academic programmes based on state-of-the-art R&D.
2. To attract and nurture quality minds who will contribute towards the global knowledge economy
3. To inculcate a strong research culture within a dynamic, efficient and effective team of academic and support staff
4. To be financially self-sustaining via education and the commercialisation of R&D products and services.



# Outcome-Based Education

## **Vision of the Faculty**

To be a leading engineering faculty for creation, preservation and dissemination of knowledge, training of knowledge workers for nation building, and providing continuous technical support for the ICT industry in Malaysia

## **Mission of the Faculty**

1. To produce multi-skilled graduates who are able to spearhead nation-building in the Information Age
2. To provide opportunities and resources for academic and researchers to carry out the state-of-the-art research and development work
3. To support the growth of nationwide ICT industry through provision of continuous professional development of knowledge

# Outcome-Based Education

**Programme Educational Objectives (PEO)** are **long term goals (5 years or more after graduation)** describing expected achievements of graduates in their career.

## **Programme Objectives (PEOs): BEng (Hons) Electrical**

1. To produce highly competent engineers in electrical engineering
2. To develop technical leaders who understand the power systems and related industry needs of the country

# Outcome-Based Education

## Example of how PEOs are linked to the Vision and Mission

Vision of the Faculty	Mission of the Faculty	Programme Educational Objectives (PEOs)
To be a leading engineering faculty for creation, preservation and dissemination of knowledge, training of knowledge workers for nation building, and providing continuous technical support for the ICT industry in Malaysia	<ol style="list-style-type: none"><li>1. To produce multi-skilled graduates who are able to spearhead nation-building in the Information Age</li><li>2. To provide opportunities and resources for academic and researchers to carry out the state-of-the-art research and development work</li><li>3. To support the growth of nationwide ICT industry through provision of continuous professional development of knowledge</li></ol>	<ol style="list-style-type: none"><li>1. To produce highly competent engineers in electrical engineering <i>Related to M 1 &amp; M2</i></li><li>2. To develop technical leaders who understand the power systems and related industry needs of the country <i>Related to M 1 &amp; M3</i></li></ol>

# Outcome-Based Education

**Programme Outcomes (PO)** are **short term outcomes (at the point of graduation)** describing what students are expected to know and be able to perform.

## **POs of B.Eng. (Hons) Electrical engineering**

1. Ability to acquire and apply fundamental principles of science and engineering.
2. Capability to communicate effectively.
3. Acquisition of technical competence in specialized areas of engineering discipline.
4. Ability to identify, formulate and model problems and find engineering solutions based on a systems approach.
5. Ability to conduct investigation and research on engineering problems in a chosen field of study.

# Outcome-Based Education

## **POs of B.Eng. (Hons) Electrical Engineering**

6. Understanding of the importance of sustainability and cost-effectiveness in design and development of engineering solutions.
7. Understanding and commitment to professional and ethical responsibilities.
8. Ability to work effectively as an individual, and as a member/leader in a team.
9. Ability to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurial skills.
10. Awareness of the social, cultural, global and environmental responsibilities as an engineer.
11. Capability and enthusiasm for self-improvement through continuous professional development and life-long learning.

# Outcome-Based Education

Table 3.1: Description of how POs are linked to the PEOs

No.	Programme Educational Objectives (PEOs)	Description of how POs are linked to the PEOs
1.	To produce highly competent engineers in electrical engineering	<p>1. Ability to acquire and apply fundamental principles of science and engineering.</p> <ul style="list-style-type: none"> <li>- <i>The graduates have firm fundamental knowledge and therefore can easily understand and adapt to any change in the technology</i></li> </ul>
2.	To develop technical leaders who understand the power systems and related industry needs of the country	<ul style="list-style-type: none"> <li>- <i>This will ensure that the graduates will be of high caliber equipped with the fundamental technical principles of science and engineering so that they can lead, facilitate and support the development of engineering practices in the industries in Malaysia</i></li> </ul> <p><i>Related to PEO 1</i></p>
		<p>2. Capability to communicate effectively</p> <ul style="list-style-type: none"> <li>- <i>Communication and networking skills are enhanced through presentations, exchanging ideas and arguing with solid rational</i></li> <li>- <i>To be a good leader, effective communication is a must</i></li> </ul> <p><i>Related to PEOs 1 and 2</i></p>

# Outcome Based Education

		<p>3. Acquisition of technical competence in specialised areas of engineering discipline.</p> <ul style="list-style-type: none"><li>- <i>The graduates have been prepared with comprehensive knowledge in the field of electrical engineering and trained with practical laboratory experiments</i></li><li>- <i>The broad and comprehensive knowledge obtained by the graduate enables them to give effective and practical solutions to industry problems</i></li></ul> <p><i>Related to PEOs 1 and 2</i></p>
		<p>4. Ability to identify, formulate and model problems and find engineering solutions based on a systems approach.</p> <ul style="list-style-type: none"><li>- <i>To become great technical leaders, the graduates should be able to identify, formulate and model problems as well as finding engineering solutions based on a systems approach</i></li></ul> <p><i>Related to PEOs 1 and 2</i></p>

# Outcome Based Education

		<p>5. Ability to conduct investigation and research on engineering problems in a chosen field of study</p> <ul style="list-style-type: none"><li>- <i>The graduates are aware of existing up-to-date technologies and have strong knowledge and skills to readily contribute to the development of practical engineering solutions</i></li><li>- <i>The graduates will be able to tackle on problems and improvement by conducting research in the fields of electrical engineering and this will equip them with the capability of becoming not only as an engineer but also a researcher in developing new technologies.</i></li></ul> <p><i>Related to PEO 1</i></p>
		<p>6. Understanding of the importance of sustainability and cost-effectiveness in design and development of engineering solutions.</p> <ul style="list-style-type: none"><li>- <i>As a technical leader, the graduates will not only have to think on the design side, but will also have to ensure the design is cost-effective, reliable, and has a great sustainability</i></li></ul> <p><i>Related to PEO 2</i></p>



# Outcome Based Education

	<p>7. Understanding and commitment to professional and ethical responsibilities.</p> <ul style="list-style-type: none"><li>- <i>The graduates are made aware to implement and develop technology through good engineering conduct</i></li><li>- <i>With the additional commitment towards professional and ethical responsibilities, the graduates will be elevated in terms of attitude and awareness towards ethical issues</i></li></ul> <p><i>Related to PEOs 1 and 2</i></p>
	<p>8. Ability to work effectively as an individual, and as a member/leader in a team</p> <ul style="list-style-type: none"><li>- <i>The development of an outstanding leader will come with good team work and thus the Programme is aimed at producing engineer who is not only capable of working independently but also as a part of a team</i></li></ul> <p><i>Related to PEOs 1 and 2</i></p>

# Outcome Based Education

	<p>9. Ability to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurial skills. <i>-In order to obtain immaculate innovativeness, a great leader will have to be enriched with various skills encompassing vast areas including technical knowledge, management, leadership and entrepreneurial skills</i> <i>Related to PEOs 1 and 2</i></p>
	<p>10. Awareness of the social, cultural, global and environmental responsibilities as an engineer. <i>-The graduates are made aware and understand their roles as engineers for the society. These includes the awareness of the social, cultural, global and environmental responsibilities and the need for sustainable development</i> <i>Related to PEO 2</i></p>
	<p>11. Capability and enthusiasm for self-improvement through continuous professional development and life-long learning <i>-The graduates are encouraged to explore and learn various technical as well as interdisciplinary skills, establishing strong enthusiasm for continuing professional development and life-long learning</i> <i>Related to PEOs 1 and 2</i></p>

# Outcome-Based Education

**Learning Outcomes (LO) of subjects** are statements of a learning achievement on completion of the subject.

## **LOs of EET2056 Transient Stability of Power Systems:**

**At the completion of the subject, students should be able to :**

- **state clearly the different types stabilities as applied to Power Systems.**
- **develop models for power system components for transient stability analysis**
- **investigate the transient stability of power systems using conventional methods.**
- **perform stability analysis using energy function methods.**
- **apply extended equal area criterion for general one-machine-infinite-bus systems**

# Outcome-Based Education

Course to Program Outcomes Matrix of some courses under Electrical Engineering

Code	Subject	Po1	2	3	4	5	6	7	8	9	10	11	Total
EET2026	Power Transmission and Distribution	10	5	35	5	10	10	5	10		5	5	100
EET2036	Power System Analysis	10	5	40	10		10	5	5		10	5	100
EET 2046	Energy Conversion II	20	5	40	10		5	5	5		5	5	100
EET2056	Transient Stability of Power System	20	10	30	10	10			10		10		100
EET3066	Electrical Engineering Materials	35	10	10	10	10	5	5	10			5	100
EET3086	Switchgear and Protection	20		40	10		10	10				10	100
EET3136	Electrical Drives	10	10	40	10	10	5		10			5	100
EET3146	Electric Power Utilization & Installation	30	10	30	10		10		10				100
EET4106	High Voltage Engineering	25		40		10	10	10				5	100

# Outcome-Based Education - Electrical

Table 4.1 Description of how the Course Subjects Contribute towards POs

No.	Programme Outcomes	Descriptions
1	Ability to acquire and apply fundamental principles of science and engineering.	<ul style="list-style-type: none"> <li>- Core subjects on mathematics (Eng Maths I, II, III and IV), Circuit Theory, Electronics I, II and III, Computer and Program Design, Field Theory, Digital Logic Design, Instrumentation and Measurement Techniques, Energy Conversion I and II, Algorithm and Data Structure, Circuits and Signals, Microprocessor Systems and Interfacing, Electromagnetic Theory and Control Theory.</li> <li>- Basic concepts and theories and their relation to actual engineering systems are applied and extended in Final Year Projects and Industrial Training.</li> <li>- Extensive laboratory experiments to provide in-depth practical knowledge and hands-on experience to students.</li> </ul>
2.	Capability to communicate effectively.	<ul style="list-style-type: none"> <li>- Compulsory subject: <b>Technical Communications</b> - students acquire effective report writing and presentation skills.</li> <li>- <b>Report writing and presentations in mandatory Final Year Projects, Industrial Training and various other subjects.</b> These allow students to understand and acquire confidence in project writing and skilful presentation.</li> <li>- Participation in various competitions and social activities, e.g. MMU-TM 3G Contest, NS Competition, IET-Intervarsity Competition, Philips Young Inventor Contest, HSBC, MESCOP, etc.</li> <li>- Introduction to Cyberpreneurship – to develop business planning and presentation skills, proposal writing, negotiating and other skills.</li> </ul>

# Outcome-Based Education - Electrical

Table 4.1 continued....

3.	Acquisition of technical competence in specialised areas of engineering discipline.	<ul style="list-style-type: none"> <li>- Designed to cover core and elective subjects pertaining to the building of in-depth competence in students according to their area of specialisation. Subjects include: Energy Conversion I and II, Power system Analysis, Power Transmission and Distribution, Transient Stability of Power Systems, Power Electronics, Electrical Engineering Materials, Electric Power Utilization and Installation, Machines and Drives, Switchgear and Protection, High Voltage Engineering, Power Stations, and Power System Operation and Control.</li> <li>- Final Year Projects are related to the major in order to strengthen students' in-depth competence.</li> </ul>
4.	Ability to identify, formulate and model problems and find engineering solutions based on a system approach.	<ul style="list-style-type: none"> <li>- Balanced mix of individual and group projects and assignments - students appreciate problem formulation and solution finding.</li> <li>- Final Year Projects and design competitions, e.g. TM-MMU 3G Contest, NS Competition, KACIP (by Ericsson), HSBC Young IT Entrepreneur Awards and FMM-Festo Student Design Engineer Award (by Federation of Malaysian Manufacturers) strengthen students' capabilities to adopt a system approach in their projects</li> <li>- Most subjects have associated laboratory sessions to give students hands-on experience in identifying, formulating and modelling problems.</li> <li>- Mini Projects are geared to give emphasis to system / sub-system design methodology.</li> </ul>

# Outcome-Based Education - Electrical

5	Ability to conduct investigation and research on engineering problems in a chosen field of study.	<p>-<b>Final Year Projects</b> require students to conduct research, for example, by doing a literature review.</p> <p>-Participation in various activities, seminars and conferences oriented towards research, such as <b>M2USIC</b> (MMU International Symposium on Information and Communications Technologies), Sterling Lectures, WWAT (Workshop on Wireless Access Technology) and <b>MESCORP</b>.</p>
6.	Understanding of the importance of sustainability and cost-effectiveness in design and development of engineering solutions.	<p>-<b>TM-MMU 3G Contest</b>, Microsoft.Net Competition, National Semiconductor Competition, KACIP (by Ericsson), FMM-Festo Student Design Engineer Award (by Federation of Malaysian Manufacturers), HSBC Young IT Entrepreneur Awards.</p> <p>-<b>Final Year Projects</b> are implemented within financial constraints: - students appreciate the cost of making a product, budgeting, estimation of expenditure, capital investment, control of costs and finance, reporting results, difference between budget and forecasts, profit and loss, sales, capital and cash-flow.</p> <p>-Students are required to take the course <b>Basic Economics, Accounting and Management</b>.</p> <p>-Students are exposed to practical problems involving sustainability and cost-effectiveness during their <b>Industrial Training</b>.</p>

# Outcome-Based Education - Electrical

Table 4.1 Continued...

7.	Understanding and commitment to professional and ethical responsibilities.	<ul style="list-style-type: none"> <li>-Students are required to undertake the subjects <a href="#">Engineer &amp; Society</a>, <a href="#">Law for Engineers and Islamic Studies/Moral &amp; Ethics</a>.</li> <li>-<a href="#">Industrial Training</a> allows students to understand the roles of engineers in society and the importance of professional and ethical conduct.</li> <li>-All engineering students are members of the Engineering Society within which student chapters of IEM has been formed. One of the objectives of such an organization is to instill the understanding and commitment of students to professional and ethical responsibilities.</li> <li>-<a href="#">Seminars and talks on the roles of engineers in various industries</a>, the challenges faced in the engineering profession, the technological trend and industrial evolution, delivered by speakers from professional bodies and industries are organized frequently throughout the academic year, both by the Faculty and Engineering Society. Examples of such events are career talks by successful professional engineers during the Engineering-Week (E-Week) and Sterling Lecture Series.</li> </ul>
8.	Ability to work effectively as an individual, and as a member/leader in a team.	<ul style="list-style-type: none"> <li>- Balanced mix of <a href="#">individual and group projects and assignments</a>.</li> <li>- For group projects, students are required to organize, divide and agree on job and responsibility distribution.</li> <li>- <a href="#">Industrial Training</a> gives students the opportunity to participate as an effective part of a team and to appreciate teamwork.</li> <li>- In addition, the students also learn to work in team through societal activities, e.g. E-Week, MESCORP of Engineering Society and the participation in various Engineering/IT design competitions.</li> </ul>



# Outcome-Based Education - Electrical

Table 4.1 Continued...

9.	Ability to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurial skills.	<ul style="list-style-type: none"> <li>- <a href="#">Group projects and laboratory experiments</a> allow application of scientific knowledge and a practice of managing skill through tasks distribution.</li> <li>- University subjects such as <a href="#">Technical Communications</a>, <a href="#">Basic Economics</a>, <a href="#">Accounting and Management</a>, <a href="#">Introduction to Cyberpreneurship</a> and <a href="#">Law for Engineers</a> are introduced to the engineering students to train their management and leadership skills.</li> <li>- Students are to be aware that they can create jobs for themselves after their graduation through the subject of Introduction to Cyberpreneurship.</li> </ul>
10.	Awareness of the social, cultural, global and environmental responsibilities as an engineer.	<ul style="list-style-type: none"> <li>- Students are required to undertake subjects of <a href="#">Engineer and Society</a>, and <a href="#">Law for Engineers</a>. It is through these subjects that students are exposed to the roles and responsibilities of engineers in the local and global society and environment.</li> <li>- <a href="#">All engineering students are the members of the Engineering Society within which student chapters of IEM has been formed</a>. One of the objectives of such organization is to instill the understanding and commitment of students to professional and ethical responsibilities.</li> <li>- Students are required to undertake <a href="#">one co-curricular subject</a>.</li> </ul>
11.	Capability and enthusiasm for self-improvement through continuous professional development and life-long learning.	<ul style="list-style-type: none"> <li>- Students are exposed to actual industrial environment and expectations during their studies via industrial training and seminars by practising engineers from the industry. This helps to enhance students' understanding of the ever changing industrial environment.</li> <li>- <a href="#">Online learning portal for every subject with links to relevant industries</a> (e.g. Schneider, Tenaga Nasional Berhad, Siemens, and Shell seminar), standardization bodies and professional bodies.</li> <li>- Students participate in various <a href="#">workshops, seminars and conferences</a> (e.g. M2USIC (MMU International Symposium on Information and Communications Technologies), AP-NeGeMo, WWAT (Workshop on Wireless Access Technology), Sterling Lectures, I-space Lecture series from Japan universities, etc.)</li> <li>- Students are encouraged to join the Alumni Society with web portal for engineering alumni - to disseminate information and updates to all the engineering graduates.</li> <li>- Students are offered to participate in certain optional professional certification courses organised in the University, such as Microsoft, IBM, and Cisco certifications.</li> </ul>

# Outcome-Based Education

## OBE Assessment Methods

### **Direct**

Exams, assignments, tests, quizzes

Final year projects

Laboratory

Exit interview

### **Indirect**

Industrial training

Exit surveys

Course surveys

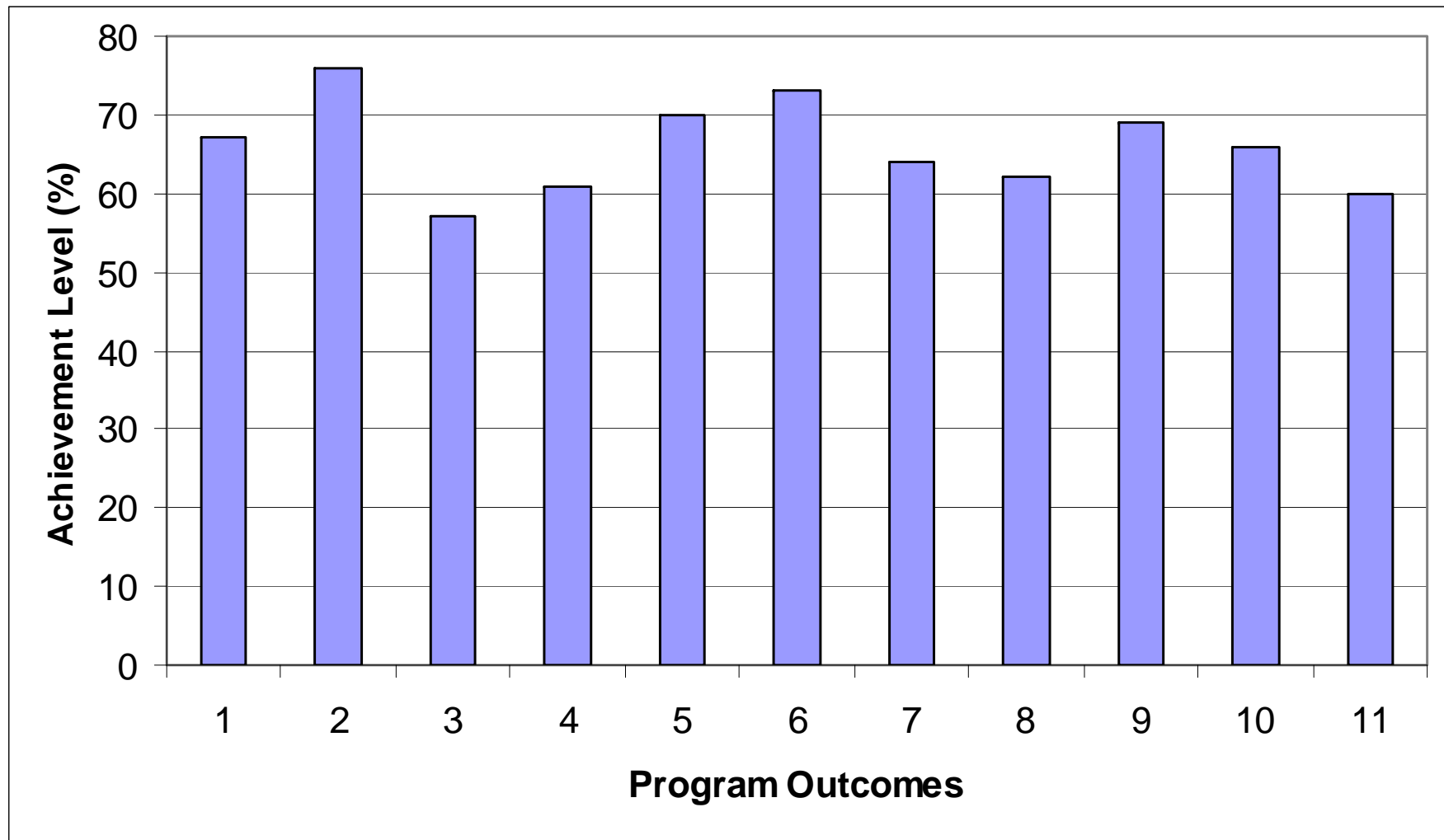
# Outcome-Based Education

## Example of Assessment Methods for Program Outcome 2: Capability to Communicate Effectively

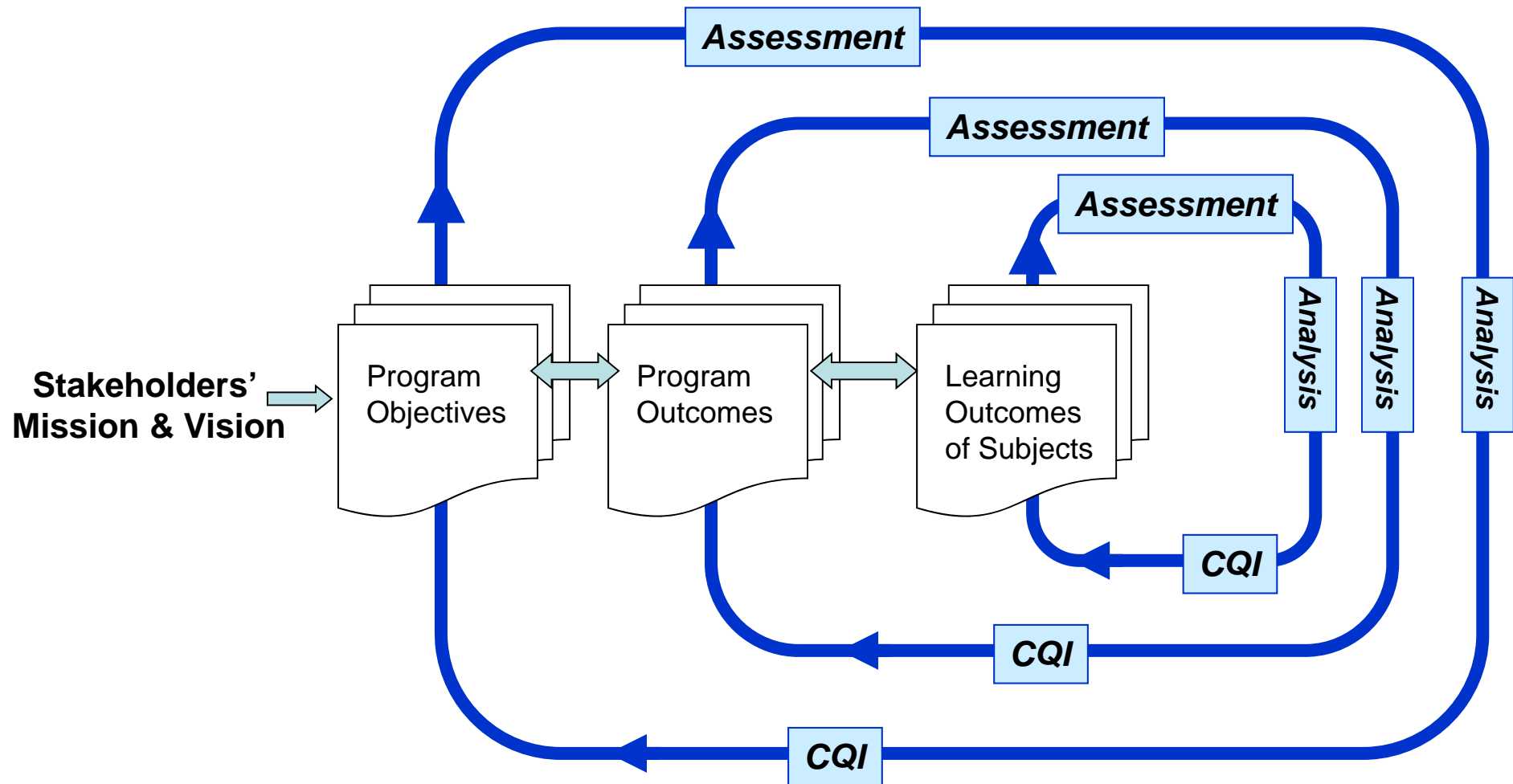
Performance Criteria	Subjects	Assessment Methods	Documents to be Kept
<ul style="list-style-type: none"> <li>Present and document ideas and experimental results properly documented in a specified format, and supported with evidence. The document must contain explanation with sufficient detail, with minimum grammatical and spelling errors.</li> </ul>	<ul style="list-style-type: none"> <li>All Subjects- Lab Experiments, FYP, ITP, Mini Projects</li> </ul>	<ul style="list-style-type: none"> <li>Coursework and exam</li> <li>presentation of Final Year Project and Industrial Training reports</li> <li>Lab Reports</li> </ul>	Exam scripts and assignment Final Year Project and Industrial Training reports and mark sheets, lab reports,
<ul style="list-style-type: none"> <li>Use multimedia content in oral and visual communication</li> </ul>	<ul style="list-style-type: none"> <li>EPT4046 Final Year Project, EPT4066 Industrial Training</li> <li>Mini Project</li> <li>Other Seminars, and</li> <li>Meetings</li> </ul>	<ul style="list-style-type: none"> <li>Presentation of Final Year Project, Industrial Training, Mini projects and other seminars</li> </ul>	Final Year Project and Industrial Training, Mini Projects mark sheets, PowerPoint presentation slides. Attendance records in other seminars
<ul style="list-style-type: none"> <li>Respond to audience's questions correctly and confidently</li> </ul>	<ul style="list-style-type: none"> <li>EPT4046 Final Year Project, EPT4066 Industrial Training,</li> <li>EPT3016 Mini Project,</li> <li>other seminars and</li> <li>meetings</li> </ul>	<ul style="list-style-type: none"> <li>Presentation of Final Year Project, Industrial Training, Mini projects and other seminars</li> </ul>	Final Year Project and Industrial Training, Mini Projects mark sheets, PowerPoint presentation slides. Student attendance records in other seminars

# Outcome-Based Education

## Review of PO Achievement

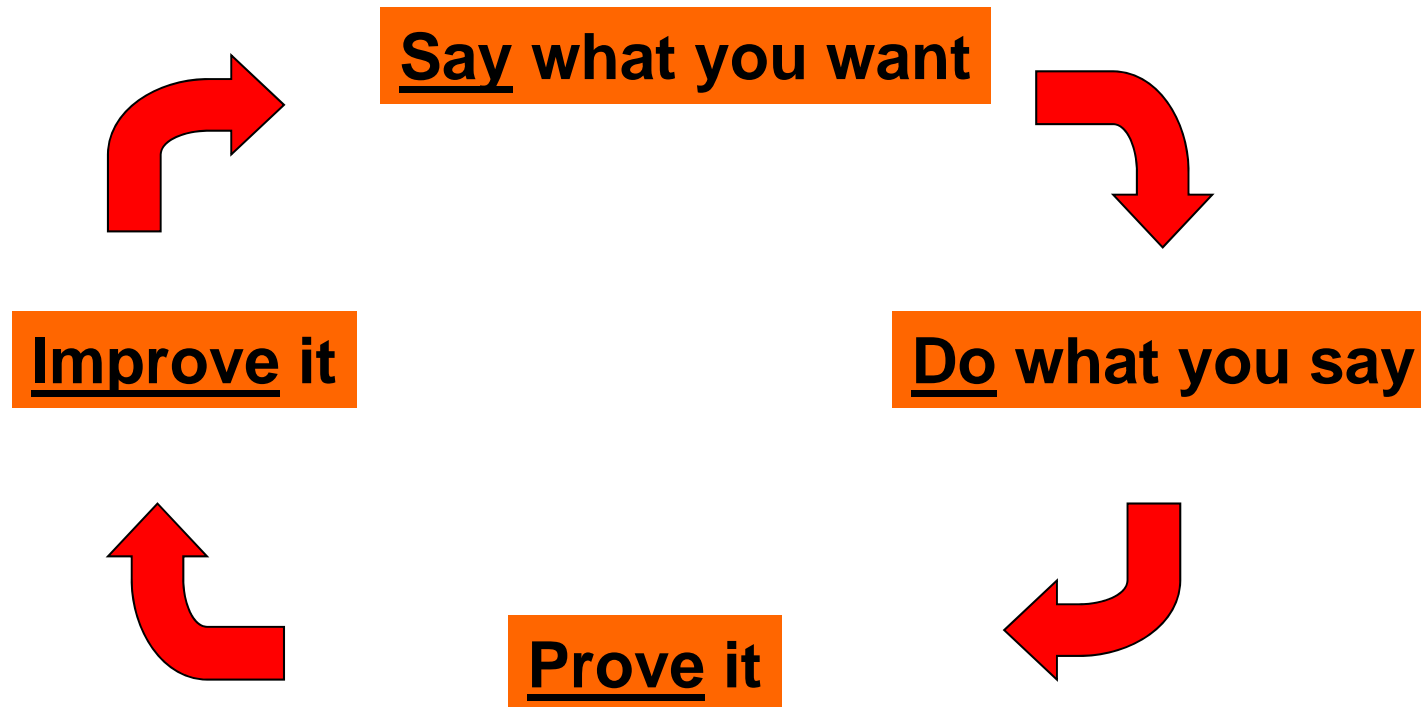


# Outcome-Based Education



# Outcome-Based Education

## Continuous Quality Improvement (CQI)



# Roles of Lecturers

- Review PEOs, POs, course structures and syllabi.
- Teach the relevant engineering, maths, and other relevant subjects.
- Conduct relevant tutorials and laboratory practical sessions.
- Give appropriate guide on assignments and projects.
- Conduct empirical measurements of POs.
- Prepare the required documentation.
- Assure EAC and public on the standard of our graduates.
- Obtain and maintain accreditation from EAC through Continuous Quality Improvement (CQI).

# Roles of Students

- ✓ Know the required Programme Outcomes and Programme Objectives (available at the FOE website).
- ✓ For each course, review the Learning Outcomes (available at the FOE website/uploaded in MMLS) at the beginning of each trimester. This gives you an idea of the knowledge and skills expected from a particular course.
- ✓ Be more proactive in the learning process to acquire the Learning Outcomes of subjects.
- ✓ Demonstrate through the assessment methods that the required skills and knowledge have been acquired.
- ✓ Attain the Programme Outcomes and Programme Objectives as a whole during the entire programme.
- ✓ Give constructive feedbacks on the programme/course/academic staff to obtain accreditation through active participation in Online Teaching Evaluation, Academic Advisory System, Dialog Sessions with the Dean, etc.



**The End**

**Q & A**

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