

CHAPTER 2
PROFESSIONAL ENGINEERING
BODIES

Professional Engineering Bodies

- At the end of this chapter, students should be able to
 - Explain the procedures and importance of being registered with BEM as a graduate engineer
 - Describe the requirements and route to be registered as a professional engineer in Malaysia
 - Describe various Professional Engineering bodies related to the field of Mechanical Engineering locally and abroad

2.0 Professional Engineering Bodies

Contents

- 2.1 The Board of Engineers Malaysia, BEM
- 2.2 The Institution of Engineers Malaysia, IEM
- 2.3 The American Society of Mechanical Engineers, ASME
- 2.4 The Institute of Marine Engineering Science and Technology United Kingdom (IMarEST)



2.1 Board of Engineers Malaysia, BEM

Board of Engineers Malaysia – BEM

- The Board of Engineers Malaysia (BEM)
 - Statutory body constituted under the Registration of Engineers Act 1967 (REA)
 - Officially formed in 23rd August 1972
 - BEM falls within the ambit of responsibility of the Minister of Works
 - Appointment of the Board Members and the Registrar is made by the Minister

Board of Engineers Malaysia – BEM

- In essence, the Board is established for the purpose of regulating the professional conduct and practice of registered engineers in order to safeguard the safety and interest of the public

Composition of BEM

- BEM consists of 17 Board Members comprising of
 - President
 - 14 Professional Engineers:
 - 5 public sector
 - 5 private practice
 - 2 from local authority or statutory authority
 - 2 private sector (full time employment)
 - 1 representative of the Board of Architects Malaysia
 - 1 representative of the Quantity Surveyors Malaysia

Functions of BEM

- The functions are
 - Maintaining the Register
 - Processing Applications for Registration
 - BEM through its Examination and Qualification Committee conducts the Professional Assessment Examination (PAE)
 - Assess the quality of experience gained by the Graduate Engineers and his competency

Functions of BEM

- Every application for registration, be it as Graduate Engineers, Professional Engineers, Engineering Consultancy Practices or Temporary Engineers by foreign engineers is scrutinized thoroughly by the Application Committee
 - Ensure compliance with the Act and with the policy of BEM

Assessment of Academic Qualifications

- BEM through its Engineering Accreditation Council (EAC) assesses and accredits engineering degrees offered by institutions of higher learning
- The EAC is the co-ordinating body on accreditation, representing the BEM, IEM, Lembaga Akreditasi Negara (LAN) and Jabatan Perkhidmatan Awam Malaysia (JPA)
- The accreditation team visits the institution to audit the facilities and have dialogue with academic staff and students

Regulating the Conduct and Ethics of the Engineering Profession

- BEM has been a medium for the engineers to decide on matters relating to their professional conduct or ethics
 - Any matter concerning the professional conduct of registered engineers will be studied by the Board to determine whether there is a breach of professional ethics or code
 - Scale of Fees
 - Scale of Fees Committee of BEM continues to have dialogues sessions with the Federal Treasury on issues involving mode of remuneration, quantum and conditions of payment

Publication

- Publication Committee of BEM undertakes the task of promoting engineering profession through Buletin Ingenieur and other printed materials
- **Bulletin Ingenieur** (4 issues per year: March, June, Sept and December) is used as a communication tool for BEM to disseminate information on the activities of the Board, regulations, code of ethics, career development, update and guidelines and such other news as decided by the Board

Promotion of Continued Learning and Education

- BEM will consider providing financial assistance to seminar or conference which is organised by a non-profit making organisation.
- BEM would also consider giving grant to selected type of study or contribute prizes for selected engineering competition. BEM also purchase engineering reference books which all engineers have access to in the library.

GRADUATE ENGINEERS REQUIREMENTS AND PROCEDURES

- **Any person who wants to take up employment as an engineer must be registered as a Graduate Engineer with BEM**
- BEM recognises the experience gained by an engineering graduate only after he has registered as a Graduate Engineer
- As such, it is prudent for an engineering graduate to register as a Graduate Engineer at the very beginning of his engineering career

REQUIREMENT FOR REGISTRATION AS A GRADUATE ENGINEER

- The recognised academic qualification for registration as a Graduate Engineer with BEM includes the following
 - An engineering degree accredited/ recognised by BEM available in an approved list maintained by BEM
 - A pass in Part I & Part II of the Engineering Council Examination of United Kingdom or
 - Part I & Part II of the IEM/BEM Graduate Examination in any particular branch

BRANCHES OF ENGINEERING

- For graduate registration, the candidate will be placed in the branch as stated in his basic degree certificate
- BEM registers engineers in 86 different disciplines

PROCEDURES FOR REGISTRATION AS A GRADUATE ENGINEER

- Registration procedure
 - The applicant shall submit his application in Form A
 - The completed Form A shall be submitted together with
 - **Certified copy of the degree certificate**
 - **Certified copy of the transcript of academic record or detail of course and subjects taken which is issued by the university**
 - **Certified copy of Identity Card**
 - **Processing fee of RM50.00**

PROCEDURES FOR REGISTRATION AS A GRADUATE ENGINEER

- Registration procedure
 - The certified copy of the degree certificate from a foreign university which is not in the English language shall be accompanied by a translation of it in Bahasa Melayu or English
 - Every document submitted must be certified as a true copy by a Professional Engineer who is registered with BEM

PROCEDURES FOR REGISTRATION AS A GRADUATE ENGINEER

- Registration procedure
 - An applicant whose application is approved will be notified accordingly by letter
 - The letter of notification would state the registration number and the branch of engineering in which the applicant is registered
 - Branch of engineering eligible will be assessed by the board based on transcript submitted
 - The application will be decided upon by BEM within four months from the date of receipt of complete application

ENQUIRIES

- All application and enquiries pertaining to registration & accreditation shall be addressed to:

Registration Department
Board of Engineers Malaysia
Tingkat 17, Ibu Pejabat JKR
Kompleks Kerja Raya Malaysia
Jalan Sultan Salahuddin
50580 Kuala Lumpur

Tel: 03-2691 1011 ext. 7095/7096

03-2696 7095 / 7096

Fax: 03 - 2692 5017

E-mail: application@bem.org.my

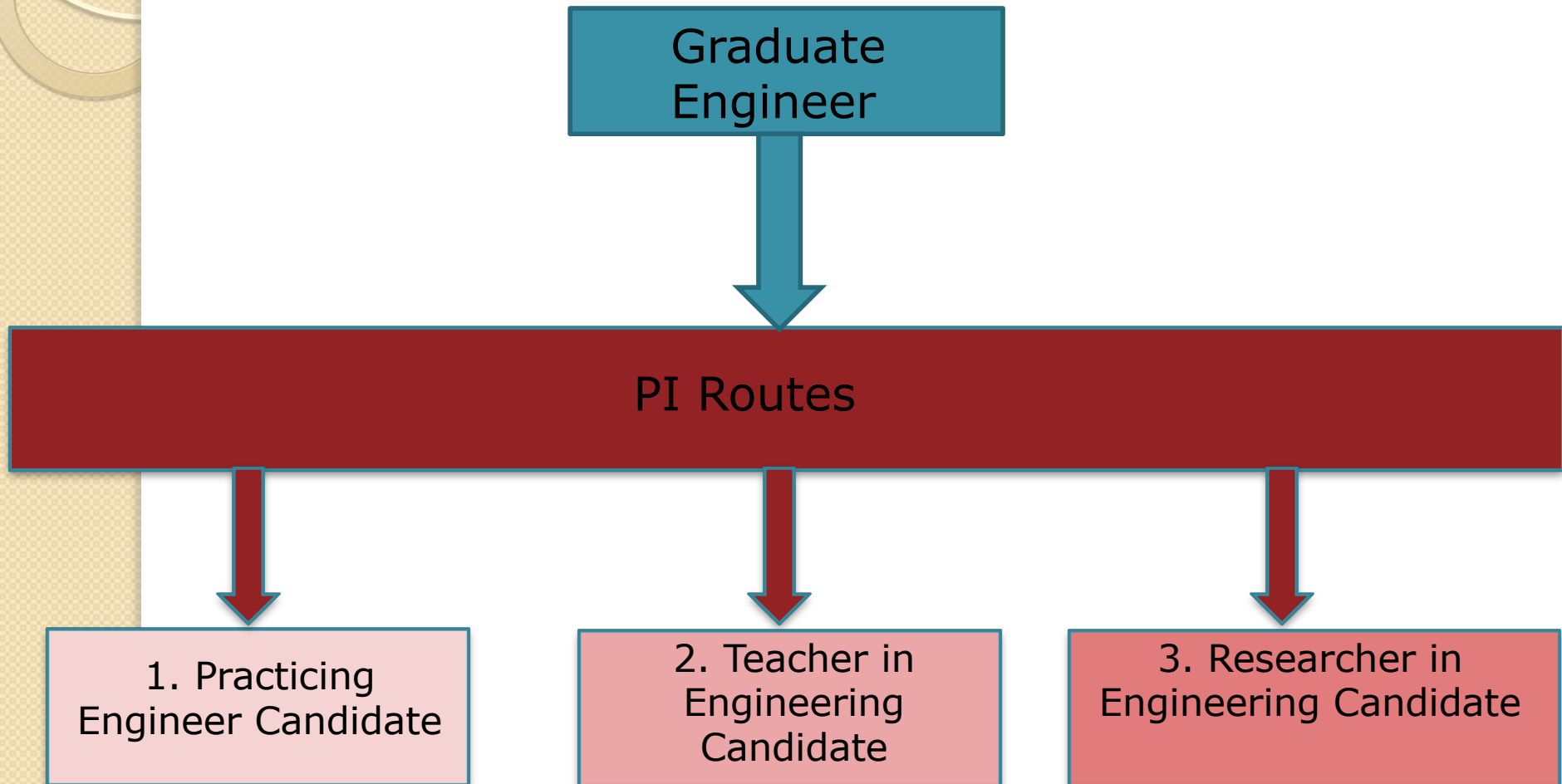


2.1.1 Route To Professional Engineer

ROUTE TO A PROFESSIONAL ENGINEER

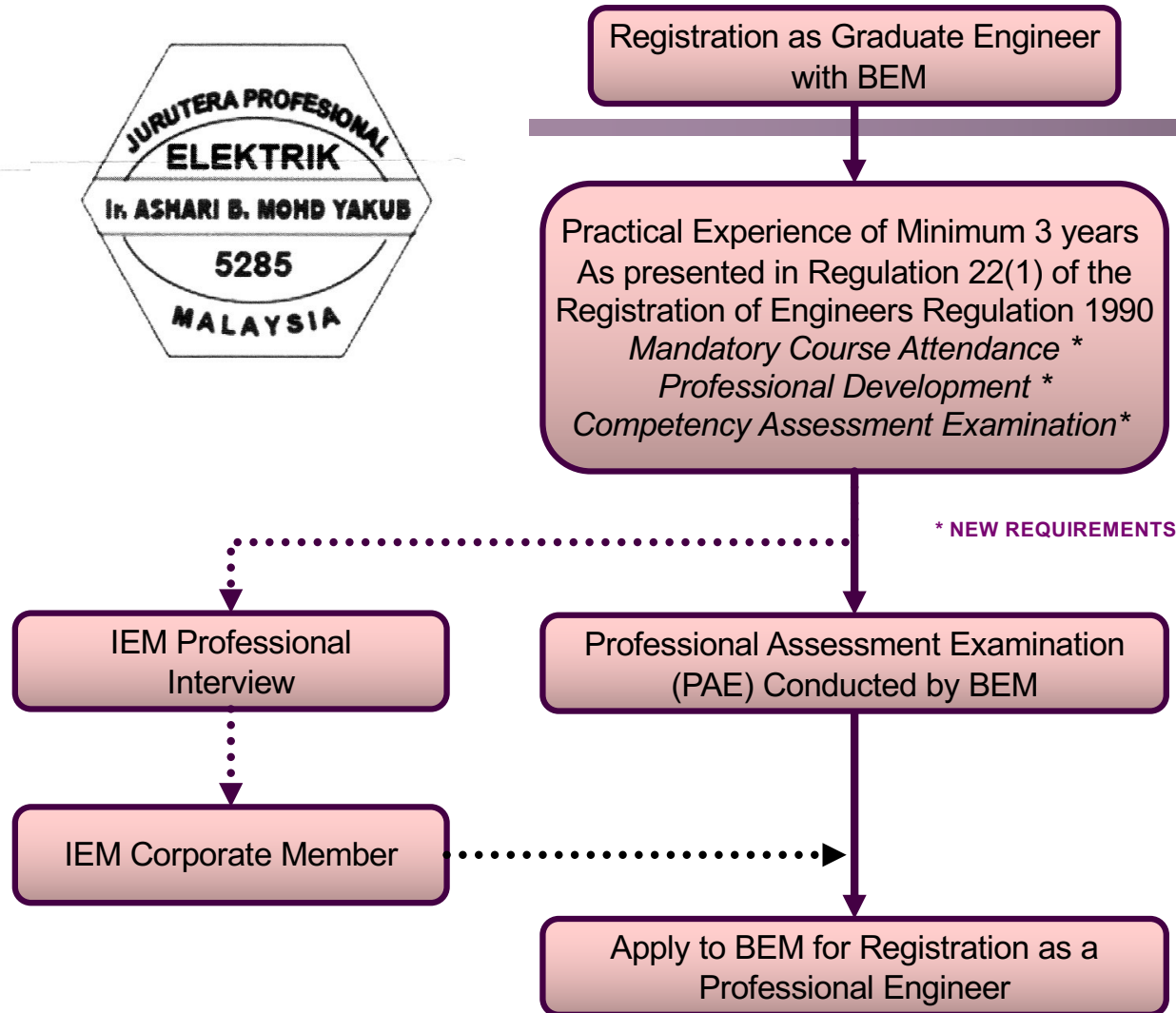
- Any candidate who applies for registration as a Professional Engineer must:
 - Be registered as a Graduate Engineer with BEM; and
 - Have satisfied the training requirements of BEM; and
 - Have passed the Professional Assessment Examination (PAE) of BEM or be elected as a Corporate Member of the Institution of Engineers Malaysia (IEM); and
 - Have been residing in Malaysia for a period of not less than six months immediately prior to the date of application

ROUTE TO A PROFESSIONAL ENGINEER



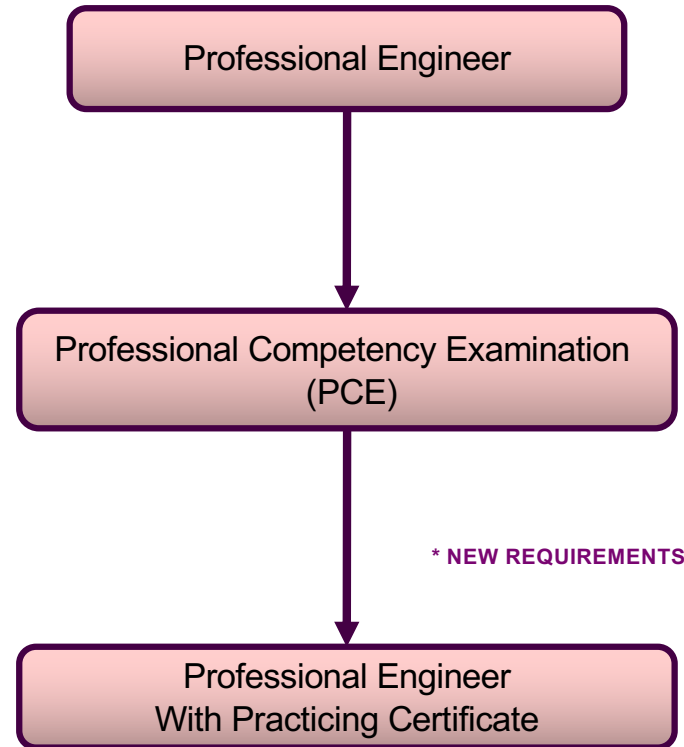
ROUTE TO A PROFESSIONAL ENGINEER

Without practicing certificate



ROUTE TO A PROFESSIONAL ENGINEER

With practicing certificate





ROUTE TO A PROFESSIONAL ENGINEER

Without practicing certificate

Section 7(1) of the amended REA;

“7(1) No person shall, unless he is a Professional Engineer -

- (a) ~~practise, carry on business or~~ take up employment which requires him to carry out or perform professional engineering services;*
- (aa) be entitled to describe himself or hold himself out under any name, style or title -*
 - (i) bearing the words “Professional Engineer” or the equivalent thereto in any other language;*
 - (ii) bearing any other word whatsoever in any language which may reasonably be construed to imply that he is a Professional Engineer; or*
 - (iii) using the abbreviation “Ir.” before his name or the abbreviation “P.Eng.” after his name or in any way in association with his name;*
- (b) use or display any sign, board, card or other device representing or implying that he is a Professional Engineer; or*



ROUTE TO A PROFESSIONAL ENGINEER

Without practicing certificate

- ~~(c) be entitled to recover in any court any fee, charge, remuneration or other form of consideration for any professional engineering services rendered; or~~
- (d) use the stamp as may be prescribed by the Board”

ROUTE TO A PROFESSIONAL ENGINEER

With practicing certificate

The entitlement to practice and carry on business to provide professional engineering services is transferred to the Professional Engineer with a Practising Certificate in a new Section 7(1A) which reads as follows;

- *7(1A) A person shall not, unless he is a Professional Engineer with Practising Certificate -*
- (a) practice, carry on business or take up employment which requires him to carry out or perform professional engineering services for designated engineering works subject to section 8;*
 - (b) be entitled to describe himself or hold himself out under any name, style or title -*
 - (i) bearing the words “Professional Engineer with Practising Certificate” or equivalent in any other language; or*
 - (ii) bearing any other words in any language which may reasonably be construed to imply that he is a Professional Engineer with Practising Certificate*
 - (c) use or display any sign, board, card or other device representing or implying that he is a Professional Engineer with Practising Certificate;*
 - (d) be entitled to recover in any court any fee, charge, remuneration or other form of consideration for any professional engineering services rendered subject to section 8; or*
 - (e) use the stamp as may be determined by the Board.”*

The new Section 7(1A) has taken all the entitlements of the existing Professional Engineer and transferred these entitlements (except for one) to a Professional Engineer with a Practising Certificate in a new Section 8(A).



ROUTE TO A PROFESSIONAL ENGINEER

Without practicing certificate

“Plan or drawing which a Professional Engineer may submit

- 8A (1) *A Professional Engineer may submit plans or drawings to any person or authority in Malaysia where such plans or drawings are in relation to an equipment, a plant or a specialised product invented or sold by him or his employer*
- (2) *The employer referred to in subsection (1) shall not include a client”*

This is the only entitlement of a Professional Engineer apart from taking up employment and the title to be recognized as a “professional”.

TRAINING REQUIREMENTS

- The practical experience that a registered Graduate Engineer is required to obtain under Section 10 (I) (b) of the Act in order to be entitled to apply for registration as a Professional Engineer shall be carried out in a manner satisfactory to the Board for a period of three years

TRAINING REQUIREMENTS

- in the planning, design, execution or management of such works as comprised within the profession of engineering;
 - in engineering research; or
 - in the teaching in a course leading to a qualification in engineering research; or
 - in the teaching in a course leading to a qualification approved by the Board, and at least one Year of such practical experience shall be obtained in Malaysia under the supervision of a registered Profession Engineer of the same discipline or an approved allied discipline and shall be in fields of engineering practice other than in research or teaching

TRAINING REQUIREMENT

- Where there is no Professional Engineer of the same or allied discipline as the candidate in the organisation in which the candidate is working, he may seek the approval from BEM to obtain a Professional Engineer from outside his organisation to supervise his training
- The total practical experience to be obtained shall not be less than three years
- After the candidate has completed the required prescribed training, he may apply to sit for the Professional Assessment Examination (PAE) conducted by BEM

NEW REQUIREMENTS

- From January 1, 2007, the PAE would be conducted solely by IEM on behalf of BEM
- New requirements as in BEM circular No. 2/2005
- New Competency Assessment Examination (CAE)
- From January 1, 2008, candidates who want to sit for the PAE will also have to sit for an additional competency examination (CAE)
- The CAE will cover competency in the practice as well as in the laws of the land



**BOARD OF ENGINEERS
MALAYSIA**

CIRCULAR NO. 2/2005

**ADDITIONAL EXPERIENCE REQUIRED OF GRADUATE ENGINEERS TO BE
ENTITLED TO APPLY FOR
PROFESSIONAL ENGINEER REGISTRATION**

Regulation 22, Registration of Engineers Regulation 1990 (Amendment) 2003 reads:

22. (1) The practical experience that a Graduate Engineer is required to obtain under section 10(1) of the Act so as to be entitled to apply for registration as a Professional Engineer shall be carried out to the satisfaction of the Board for a period of at least three years, and shall include the following –

- (a) the Graduate Engineer must undergo –*
 - (i) at least two years of general training that will provide a sound basis for professional development; and*
 - (ii) at least one year of professional career development and training providing wide exposure to the various managerial and technical expertise in engineering practice*

where at least one year of the training must be obtained in Malaysia under the supervision of a Professional Engineer in the same branch of engineering as that practiced by the Graduate Engineer, although Professional Engineers in other related branches of engineering may be acceptable with prior approval of the Board; and

- (b) the Graduate Engineer must have satisfactory attendance in courses and professional development programmes determined by the Board, and conducted by the Board or institutions approved or accredited by the Board.*

Date : 13.08.2004

BEM/RD/APP/16

NO. SIRI: 0016

The Board has decided that compliance to Regulation 22 (1)(b) be as follows:

A. Satisfactory attendance in the following courses conducted by BEM or institutions approved by BEM

(i)	Code of Ethics	12 hrs
(ii)	Health and Safety at Work	12 hrs
(iii)	Engineering Management Practice	12 hrs and
(iv)	Courses related to graduate's branch of engineering	24 hrs

and

B. Completion of not less than 30 units of Professional Development which includes attendance at:

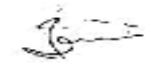
- (i) technical talks
- (ii) seminars
- (iii) society/association meetings and
- (iv) community services

(One unit of Professional Development is equivalent to one hour's participation in the above-mentioned activities subject to a maximum of four units in a day)

Regulation 22 (1) (b) has been in practiced since 1st January, 1998, and many graduate engineers have gained valuable information from the experiences of the course lecturers. The Professional Development Activities have provided wide exposure and networking to the young Graduate Engineers.

For Graduates registering after 1st January, 2005, the Board will require evidence of compliance to Regulation 22(1)(b) before the Graduate applies for registration as a Professional Engineer.

Made the 18th January 2005
[BEM-242nd Meeting / 13th August 2004]



TAN SRI DATO' Ir. Hj. ZAINI BIN OMAR
President
Board of Engineers, Malaysia

ENTITLEMENT OF A PROFESSIONAL ENGINEER

- Ingenieur : use of prefix Ir
- Professional Engineer : use of P.Eng at end
 - Example: Ir. Shabudin Bin Mat, P.Eng



2.1.2 Professional Assessment Examination, PAE

PROFESSIONAL ASSESSMENT EXAMINATION (PAE)

- REQUIREMENTS & PROCEDURES

- Application Form G is to be submitted together with the prescribed fee of RM200.00
- On approval of the application, BEM shall appoint a Principal Examiner who in turn shall appoint a Second Examiner
 - The Examiners shall be either of the same or approved allied discipline as that of the candidate.

PROFESSIONAL ASSESSMENT EXAMINATION (PAE)

- The Principal Examiner shall write to the candidate advising the date by which the documents required for the Examination are to be sent to him and the place, time and date of the Examination
- All documents required by the Principal Examiner shall be sent to him by post
- The documents shall be accompanied by a completed BEM/Form/PAE/02 (Form I)
- PAE will consist of professional interview, followed by essay writing
- In the professional interview, the practical experience of the candidate will be assessed by the Examiners both on time and quality basis
- The Examiners shall test the candidate during the interview on the following aspects:
 - Understanding of the application of engineering principles to the solution of problems arising from the investigation, planning, design, construction, operation or maintenance of engineering works; or on the subject of his research; and
 - The ability to communicate

PROFESSIONAL ASSESSMENT EXAMINATION (PAE)

- The candidate is required to write two essays, one each from Section A and Section B. Section A is for an essay related to the candidate's training and experience as stated in his report
 - Essay for Section B will be on the code of ethics
- The candidate will be required to choose one out of two questions from Section A
 - Candidate is also required to answer a question from two alternative questions selected by the examiners on code of professional conduct (Section B)
- 1 1/2 hours will be allowed for each written paper
- The essays are intended primarily to test the candidate's ability to marshal his knowledge and thoughts and to express them in words in a clear and concise manner



2.1.3 Documents Preparation for PAE

PREPARATION OF DOCUMENTS FOR PROFESSIONAL ASSESSMENT EXAMINATION (PAE)

- **A - GENERAL REQUIREMENTS**
 - Every candidate for the Examination shall submit the following documents
 - Two copies of a typewritten report, giving an account of his training and experience
 - Single copy of other documents and/or drawings
 - Every drawing and document shall be certified by a Professional Engineer who is in a responsible position as the employer or the principal for whom or under whom it was prepared
 - In the case of overseas experience, the drawings and documents may be signed by a Professional Engineer
 - The Professional Engineer must certify on BEM/Form/PAE/02 (Form I) that the documents and drawings submitted are the work of the candidate

PREPARATION OF DOCUMENTS FOR PROFESSIONAL ASSESSMENT EXAMINATION (PAE)

- Submission of the Report
 - The report on training and experience should be of length 1500 - 2000 words and be typewritten on A4 paper
 - The report shall include organisations in which the candidate has worked (in chronological order) together with the positions held
 - The duties and responsibilities in each organisation together with the works done/projects undertaken and training undergone should be stated
 - The actual involvement of the candidate in the projects undertaken and experience gained is to be emphasized
 - At the end of the report, the candidate should give a summary of the total time spent (since registration as a Graduate Engineer) in months on the following aspects:
 - office/design work
 - site/field experience
 - planning/management, and
 - others (research, teaching etc.)

PREPARATION OF DOCUMENTS FOR PROFESSIONAL ASSESSMENT EXAMINATION (PAE)

- Submission of the Drawings/Documents
 - Consideration I
 - At least two and not more than four working drawings related to the candidate's own work; detailed design calculations prepared by him relating to one or more of the aforesaid drawings; specifications and a set of quantities, comprising abstract, takeoff sheets or shop list all prepared by him relating either to one of the aforesaid drawings, or to other drawings which must also be submitted
 - A candidate may submit an additional drawing not necessarily prepared by him, to illustrate his experience in engineering works

PREPARATION OF DOCUMENTS FOR PROFESSIONAL ASSESSMENT EXAMINATION (PAE)

OR

- Consideration 2

- The candidate must submit part of a feasibility study involving functional and economic comparison of the preliminary designs of an engineering system, or a comprehensive report of a major engineering project, or a system design of a major engineering works
- The above documents should include the following
 - At least one relevant drawing showing essential features of details of the project or system
 - Where appropriate at least three and not more than six sketches containing sufficient details to enable a draughtsman to work them up into working drawings without further guidance
 - Preliminary stress or system analysis, where applicable, and
 - Quantities, cost analysis or economic analysis as appropriate

PREPARATION OF DOCUMENTS FOR PROFESSIONAL ASSESSMENT EXAMINATION (PAE)

OR

- Consideration 3

- In the case of a candidate whose experience is in the installation or operation or maintenance of an engineering plant or engineering system, a detailed description of the installation or operation or maintenance of the plant or system together with the appropriate schedule which he has formulated must be submitted
- In his submission, he should clearly indicate his contribution which shows application of sound engineering principles
- A critical appraisal of the design of the engineering system which may not necessarily be the work of the candidate, should be included
- Details of modifications, if any, made to the existing system as a result of the work of the candidate should also be submitted

PREPARATION OF DOCUMENTS FOR PROFESSIONAL ASSESSMENT EXAMINATION (PAE)

OR

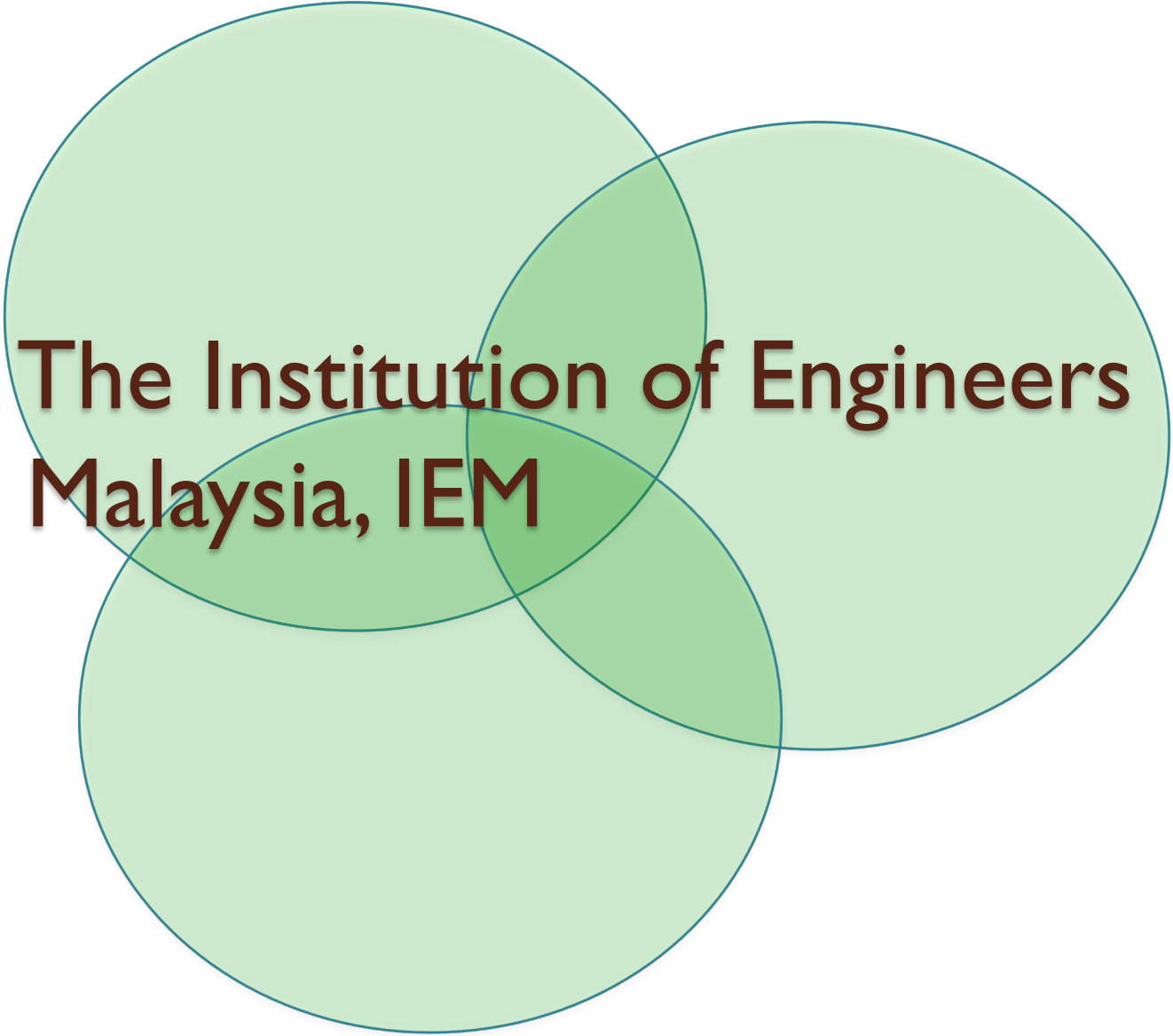

- Consideration 4 (FOR CANDIDATES ENGAGED IN RESEARCH & TEACHING)

- In the case of a candidate engaged in research and teaching, two copies of a report of not more than 4000 words in evidence of the research carried out by him should be submitted
- This report should include a brief summary of the candidate's research work, stating the subject matter and objectives, together with a short list of any papers he has published
- A thesis prepared for a higher degree is not acceptable but the candidate may include the matter of this thesis together with the new matter

Statistics

- Total Number of Engineers Registered With BEM (as of 31 December 2009)

	2009	2015
Professional Engineers (Ir)	14,084	11,387
Graduate Members	52,350	86,259
TOTAL NO. OF ENGINEERS	66,434	97,646



2.2 The Institution of Engineers Malaysia, IEM

Introduction to IEM

- The Institution of Engineers, Malaysia also known as IEM
 - A professional learned society serving more than 15,000 members in Malaysia, overseas and the communities in, which they work
 - Formed in 1959 and started out with 60 members
 - Membership has increased to 23,309 (data as of 31 March 2011), making it the largest professional body in Malaysia
 - **The Corporate member of IEM can apply to BEM for registration as a Professional Engineer**
 - Currently, the IEM has five (5) official representatives on the BEM

TYPE OF IEM MEMBERSHIP

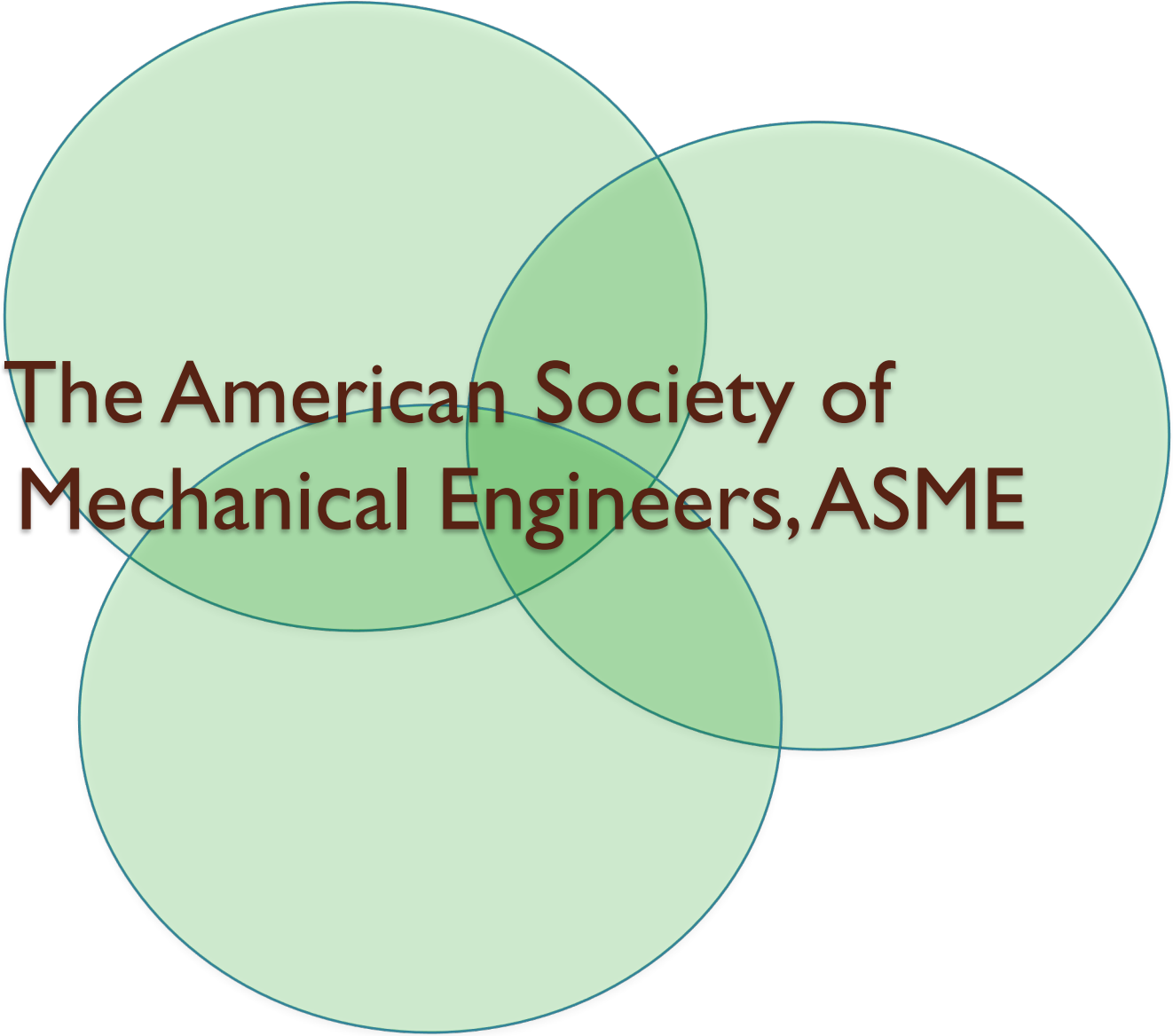

- ✓ **Student Member** – open to all engineering students
- ✓ **Graduate Member** – open to all practicing engineers registered with BEM
- ✓ **Corporate / Fellow Member** – upgrading for experience engineers leading to Professional Engineer status
- ✓ **Associate Member** – non-degree engineering practitioner; diploma or certificate holders
- ✓ **Incorporated Member** – Professional Engineers from international Engineering Institution recognized by IEM
- ✓ **Honorary Member** – distinguish person who contributed to engineering profession

BENEFITS OF IEM MEMBERSHIP

- ✓ Establish networking groups amongst engineers
- ✓ Attend Technical Talks, Seminars or Courses and Technical Visits
- ✓ Attend Professional Development Program (PDP)
- ✓ Route to Professional Engineers
- ✓ Attend Continuing Professional Development (CPD)

IEM OFFICES

- IEM Southern Branch:
24-B, Jalan Abiad, Taman Tebrau Jaya
80400 Johor Bahru
Tel: 07-331 9705
- Head-Quarters:
Bangunan Ingenieur, Lot 60/62, Jalan 52/4,
Peti Surat 223
46720 Petaling Jaya, Selangor
Tel: 03-79684001



2.3 The American Society of Mechanical Engineers, ASME

The American Society of Mechanical Engineers, ASME

- ASME is a not-for-profit membership organization that enables collaboration, knowledge sharing, career enrichment, and skills development across all engineering disciplines
- Founded in 1880 by a small group of leading industrialists, ASME has grown through the decades to include more than 120,000 members in over 140 countries around the globe
- ASME's diverse members range from college students and early-career engineers to project managers, corporate executives, researchers and academic leaders
- ASME serves this wide-ranging technical community through quality programs in continuing education, training and professional development, standards and certification, research, conferences and publications, government relations, and other forms of outreach
- ASME issued its first standard, *Code for the Conduct of Trials of Steam Boilers*, in 1914, starting a development process that has grown to more than 500 codes and standards



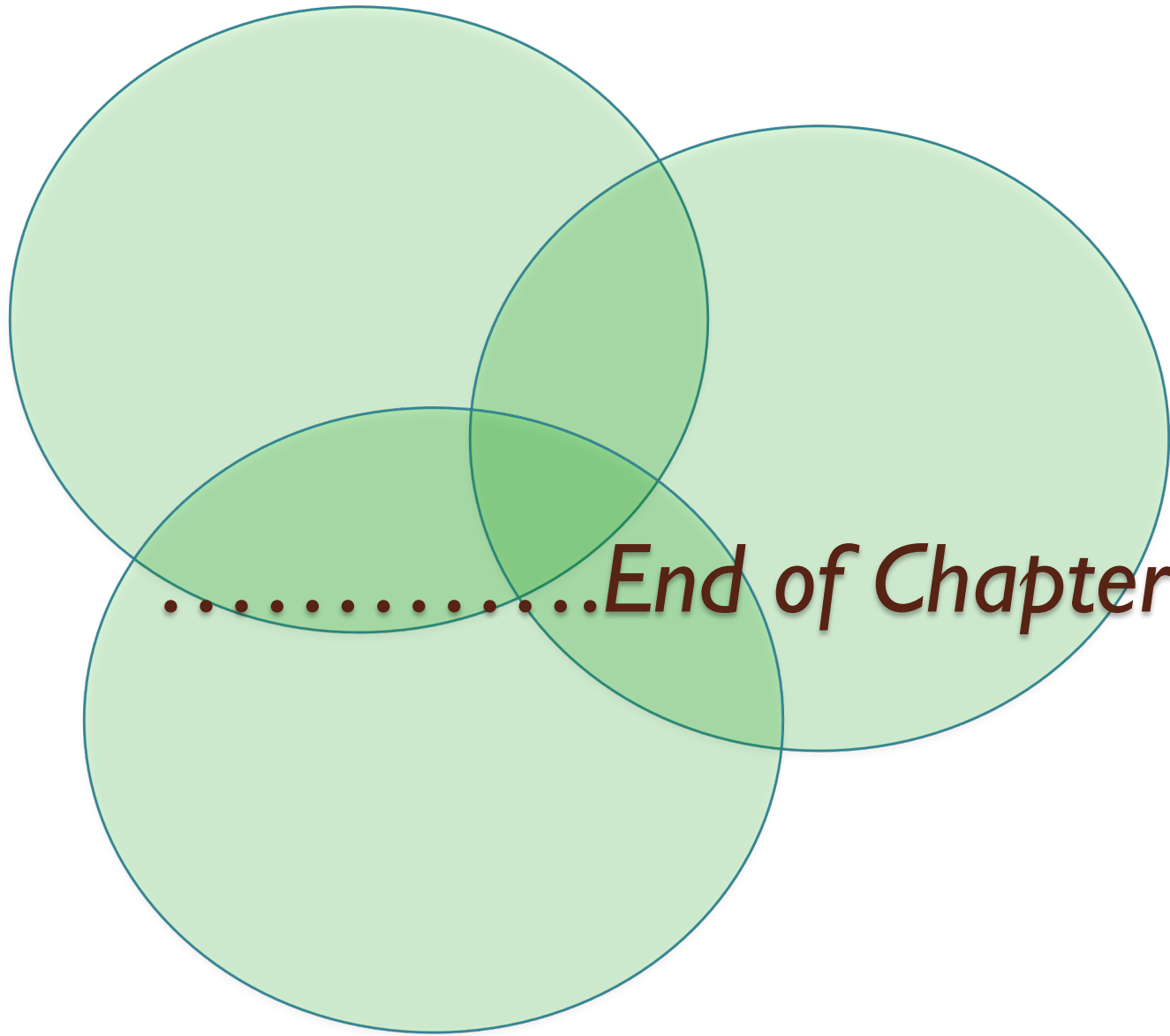
2.4 The Institute of Marine Engineering Science and Technology (IMarEST) UK

The Institute of Marine Engineering Science and Technology (IMarEST) UK

- The IMarEST was established in London in 1889 then known as The Institute of Marine Engineers but in 2002 changed to IMarEST incorporating marine professional from the marine science and technology segments and is the largest international membership body and learned society for marine professionals with over 15,000 members worldwide
- It has branch offices in 50 countries and a presence in 100 countries worldwide

The Institute of Marine Engineering Science and Technology (IMarEST) UK

- Benefits
 - Professional status and recognition: various grades of membership, professional registers e.g CEng, CMar Eng, IEng , EngTech under the Engineering Council of UK and under the Science Council of UK, CSci, RMarSci
 - Access to global marine community
 - Become part of the marine tradition. Over 120 years of the Institute's existence the leaders of IMarEST have traditionally been involved in the furtherance of the marine technology advancements
 - Opportunity – access to the IMarEST employment service, obtain career advice, support and mentoring
 - Consultation – getting involved with international and national level forum and conferences



.....*End of Chapter 2*