

Outcomes-Based Education

Jabatan Kejuruteraan Mekanik dan Bahan



11/8/2004

Mesy Khas OBE (Azmi)





What is ABET?

Accreditation Board for Engineering and Technology





What is OBE?

- ✦ Is a process that involves the restructuring of curriculum, assessment and reporting practices in education to reflect the achievement of high order learning and mastery rather than accumulation of course credits



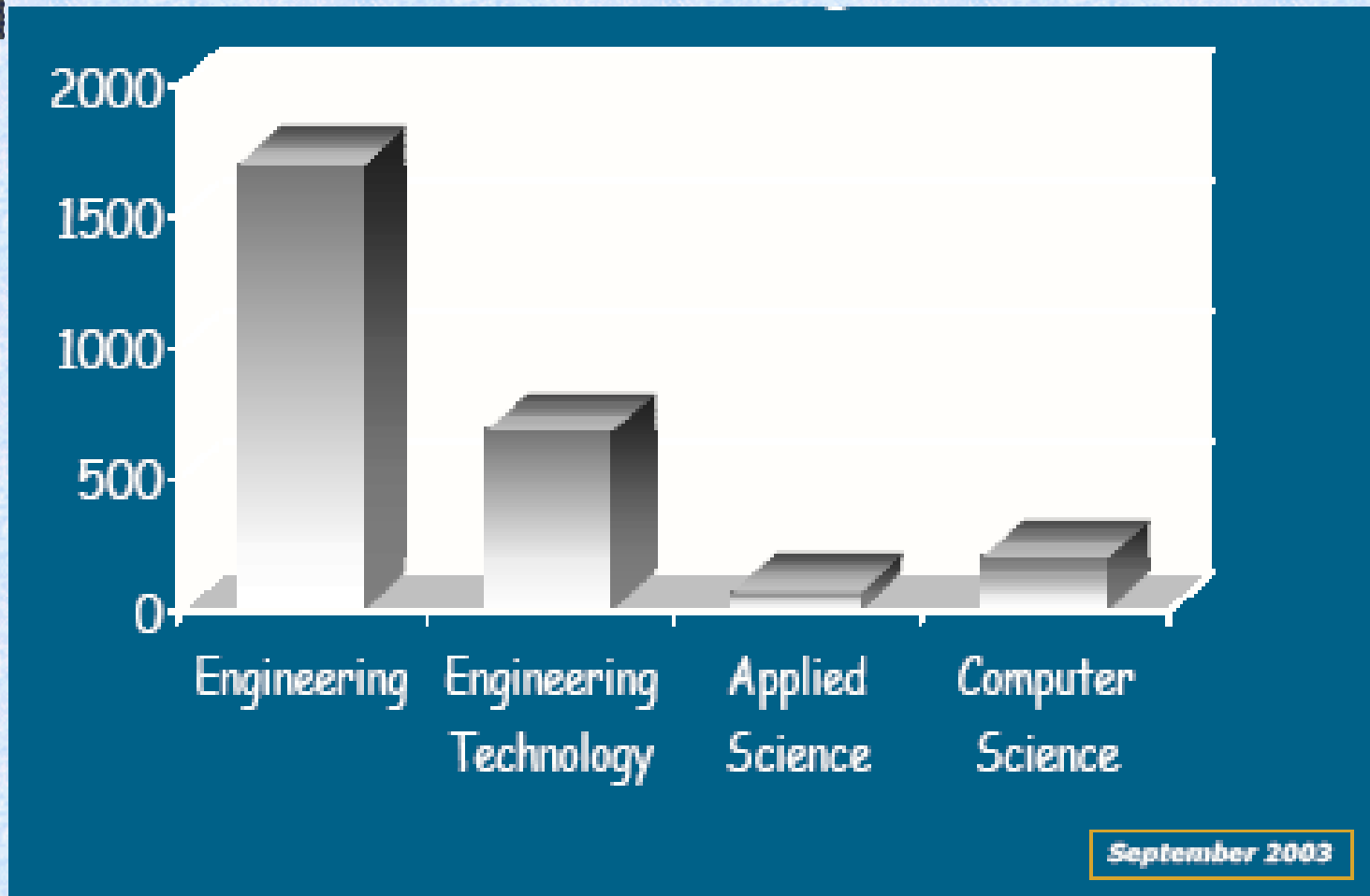


What is Outcomes?

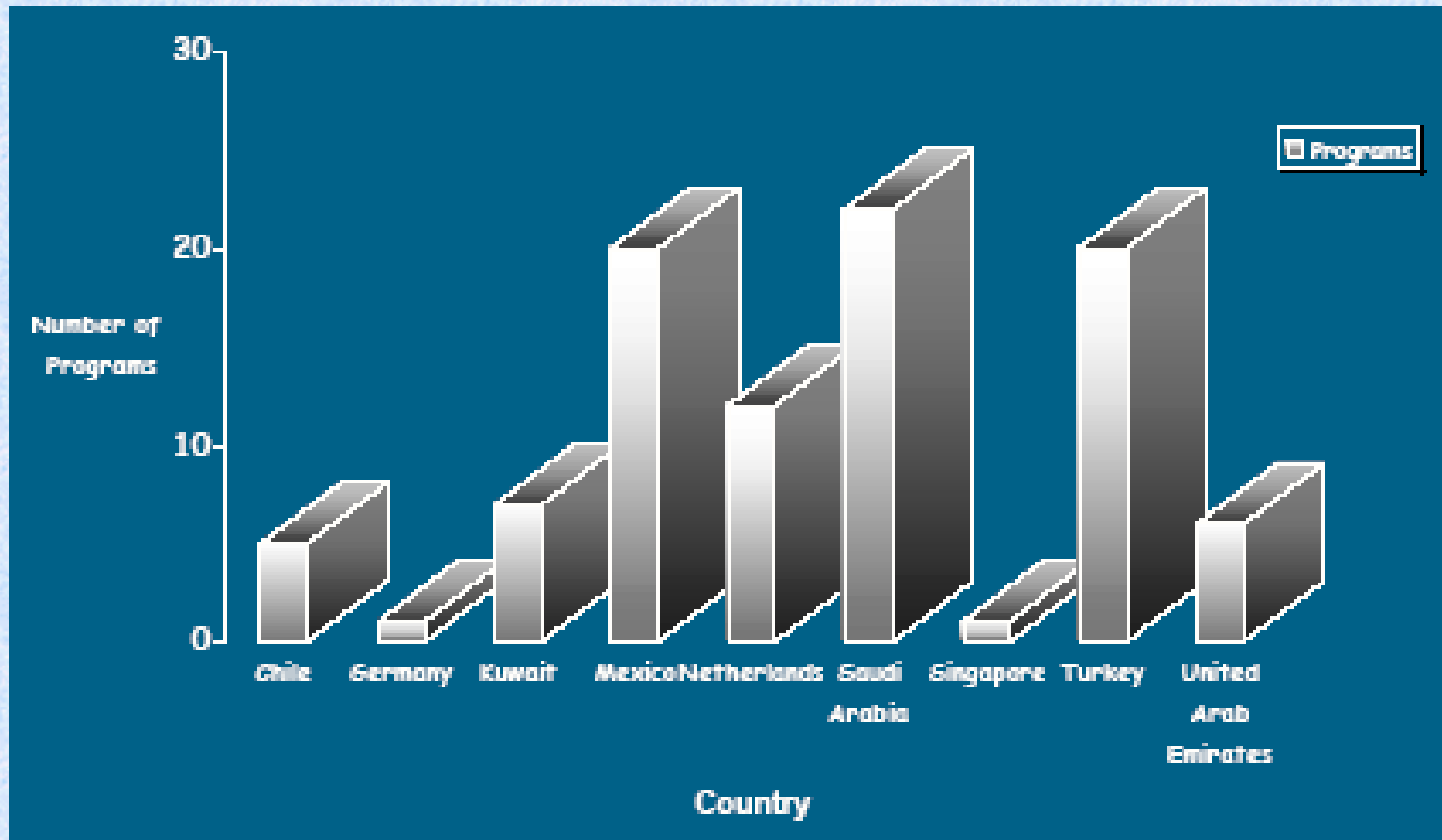
- # Not values, attitudes, feelings, beliefs, activities, assignment, goals, or grades.
- # But demonstrations, or performance reflects
 - What the student knows
 - What the student can actually do with what s/he knows
 - The student's confidence and motivation in demonstrating what s/he knows



US Accredited Programmes



Recognised International Programmes



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JKMB
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Committee of OBE-JKMB

- # Prof Madya Dr Ahmad Kamal Ariffin Ehsan (Penasihat)
- # Prof Madya Dr Azmi Hassan (Pengerusi)
- # Prof Dr Jaafar Sahari
- # Prof Madya Dr Che Hassan Che Haron
- # Prof Madya Dr Shahrir Abdullah
- # Prof Madya Dr Nordin Jamaluddin
- # En Rohaizat Mat Tahir (Setiausaha)

Common Program Educational Objectives (PEO)



1. A competent engineer with an understanding of the fundamental engineering knowledge.
2. An engineer with professional attitudes and ethics necessary in fulfilling his/her responsibilities towards the Creator, clients and the society
3. An engineer who will uphold the Malay Language as a language of knowledge in the engineering field and at the same time has the ability to communicate in English
4. An engineer who is able to adapt him/herself to the international/global work environment
5. An engineer who is able to lead an organisation based on knowledge of important current issues in engineering and experience
6. An engineer who is able to conduct research in his/her own organisation



Programmes Outcomes (PO)

1. Ability to acquire and apply knowledge of basic science and engineering fundamentals.
2. Ability to communicate effectively, not only with engineers but also with the community at large.
3. Having in-depth technical competence in a specific engineering discipline
4. Ability to undertake problem identification, formulation and solution
5. Ability to utilise a systems approach to design and evaluate operational performance.
6. Ability to function effectively as an individual and in a group with the capacity to be a leader or manager as well as an effective team member
7. Having the understanding of the social, cultural, global and environmental responsibilities and ethics of a professional engineer and the need for sustainable development.
8. Recognising the need to undertake lifelong learning, and possessing/acquiring the capacity to do so
9. Ability to design and conduct experiments, as well as to analyse and interpret data
10. Ability to function on multi-disciplinary teams
11. Having the knowledge of contemporary issues



PEO Kejuruteraan Mekanik

1. Prinsip dan Skil: Jurutera yang cekap dengan kefahaman prinsip-prinsip asas, matematik dan sains, dan sistem mekanikal dan melaksanakan penyelesaian kejuruteraan dalam bidang-bidang yang luas.
2. Misi Institusi: Jurutera yang akan memperkukuhkan bahasa Melayu sebagai bahasa ilmu dalam bidang kejuruteraan dan pada masa yang sama mempunyai kebolehan untuk berkomunikasi secara efektif dalam bahasa Inggeris.
3. Perubahan dan Pelbagai Praktik: Jurutera dengan kebolehan dalam pembangunan produk dengan bekerja secara efektif dalam pasukan pelbagai-displin, menyediakan kepimpinan dan kepakaran teknikal.
4. Penyelidikan dan Pengajian Lanjutan: Jurutera yang boleh menjalankan penyelidikan di organisasi sendiri dan berkebolehan untuk meneruskan pengajian dalam kejuruteraan dan/atau bidang pengajian lain.
5. Servis: Jurutera yang menggunakan kaedah penyelesaian secara etikal dalam menyedia dan membangun skil, kesedaran dan latarbelakang jurutera yang akan bertanggungjawab sebagai warganegara, pekerja, dan pemimpin dalam masyarakat dan dalam bidang kejuruteraan.



PEO for Mechanical Engineering

1. *Principles and Skills*: A competent engineer with an understanding of basic principles, mathematics and science, and mechanical systems and implement engineering solutions in a broad range of fields.
2. *Institutional Mission*: An engineer who will uphold the Malay Language as a language of knowledge in the engineering field and at the same time has the ability to communicate effectively in English.
3. *Changing and Diverse Practice*: An engineer with an ability of product development and working effectively in multidisciplinary teams, providing leadership and technical expertise.
4. *Research and Lifelong Learning*: An engineer who is able to conduct research in his/her own organisation and has an ability for lifelong learning in engineering and/or other fields.
5. *Service*: An engineer with an ethical approach in preparing and developing engineers' skills, awareness, and background to become responsible citizens, employees, and leaders in societies and in the field of engineering.



PEO Kejuruteraan Pembuatan

1. Prinsip dan Skil: Jurutera yang cekap dengan kefahaman prinsip-prinsip asas, matematik dan sains, proses dan sistem pembuatan dan melaksanakan penyelesaian kejuruteraan dalam bidang-bidang yang luas .
2. Misi Institusi: Jurutera yang akan memperkukuhkan bahasa Melayu sebagai bahasa ilmu dalam bidang kejuruteraan dan pada masa yang sama mempunyai kebolehan untuk berkomunikasi secara efektif dalam bahasa Inggeris.
3. Perubahan dan Pelbagai Praktik: Jurutera dengan kefahaman dalam rekabentuk dan pembuatan untuk pembangunan produk dengan keupayaan bekerja secara efektif dalam pasukan pelbagai-displin, menyediakan kepimpinan dan kepakaran teknikal.
4. Penyelidikan dan Pengajian Lanjutan: Jurutera yang boleh menjalankan penyelidikan di organisasi sendiri dan berkebolehan untuk meneruskan pengajian dalam kejuruteraan dan/atau bidang pengajian lain.
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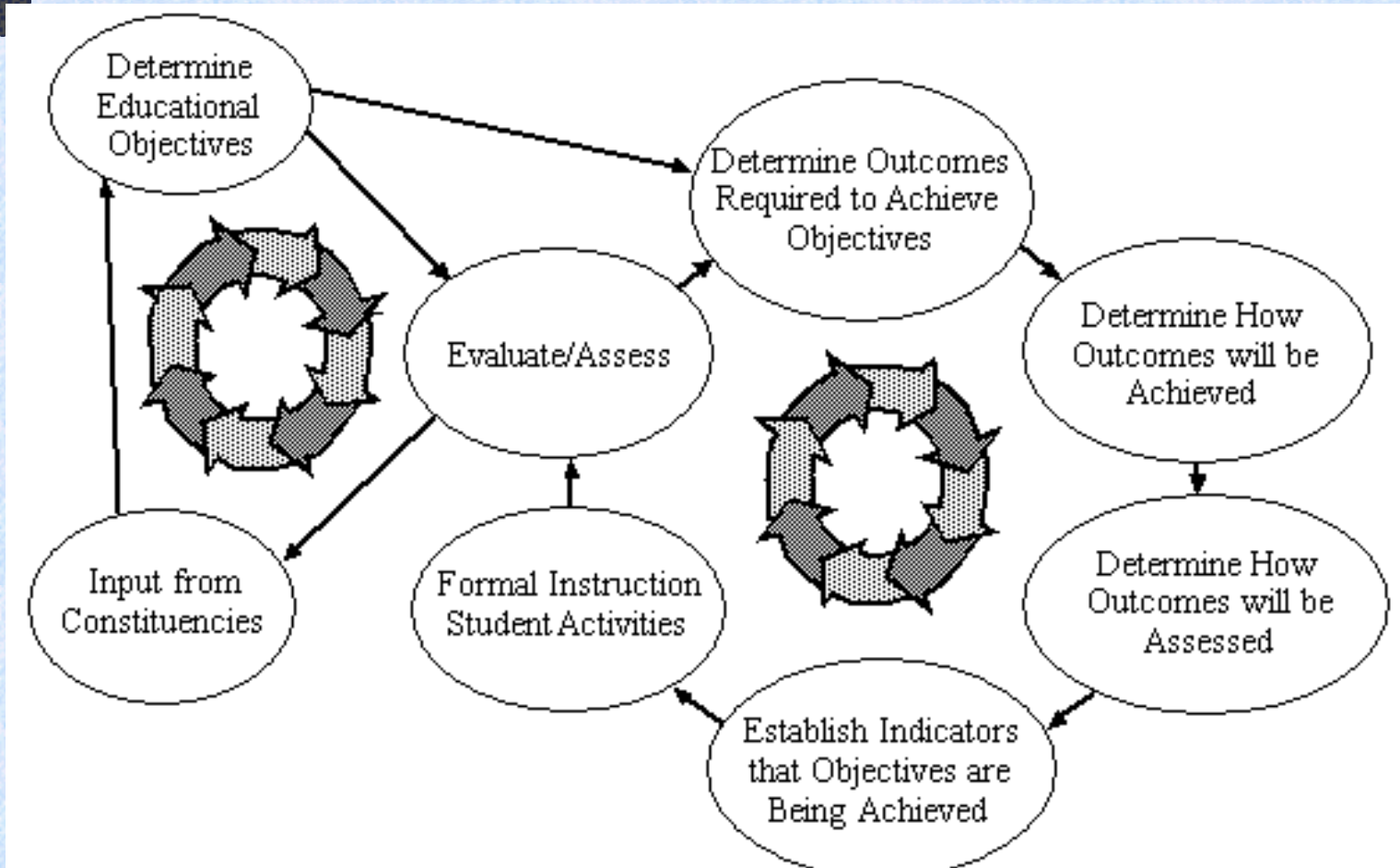


PEO for Manufacturing Engineering

1. *Principles and Skills*: A competent engineer with an understanding of basic principles, mathematics and science, and manufacturing process and systems and implement engineering solutions in a broad range of fields.
2. *Institutional Mission*: An engineer who will uphold the Malay Language as a language of knowledge in the engineering field and at the same time has the ability to communicate effectively in English.
3. *Changing and Diverse Practice*: An engineer with an understanding of design and manufacturing for product development with the capability of working effectively in multidisciplinary teams, providing leadership and technical expertise.
4. *Research and Lifelong Learning*: An engineer who is able to conduct research in his/her own organisation and has an ability for lifelong learning in engineering and/or other fields.
5. *Service*: An engineer with an ethical approach in preparing and developing engineers' skills, awareness, and background to become responsible citizens, employees, and leaders in societies and in the field of engineering.



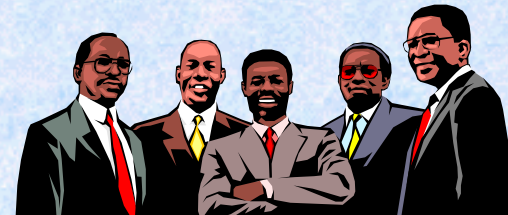
The Process of Curriculum Development





Market Survey

1. Basic Level Programs
2. That satisfies the needs of constituencies / stakeholders
 - Sponsors / Parents
 - Industries
 - Graduates
 - Students
 - Universiti Kebangsaan Malaysia
 - Government



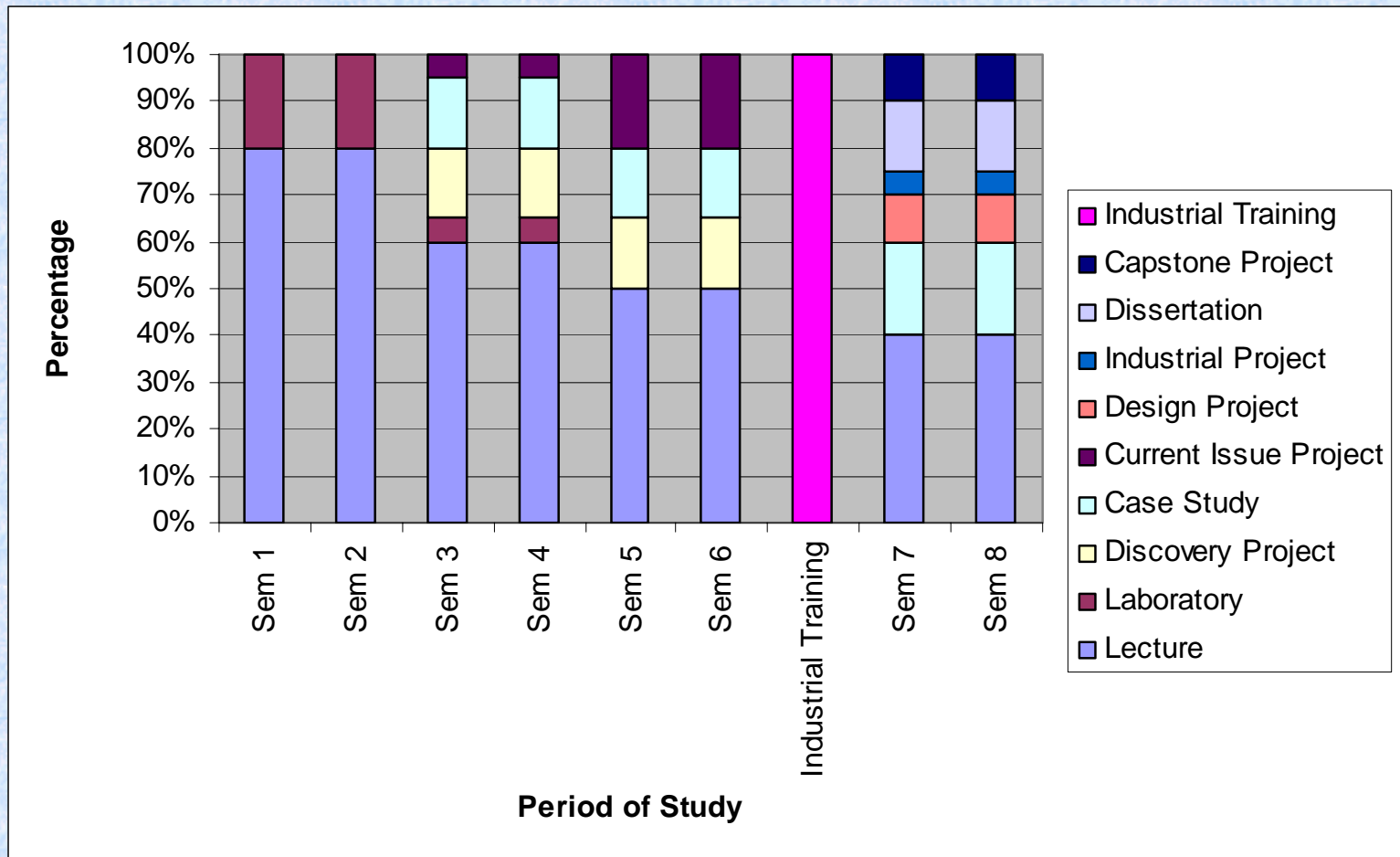
Programme Criteria (ABET 2004-2005)



1. *Mechanical Engineering (see questionnaires)*
2. *Manufacturing Engineering (see questionnaires)*



Programme Design



Programme Structure

Mechanical Engineering

- *Solid Mechanics*
- *Thermo-fluids*
- *Materials*
- *Design &
Manufacturing*
- *Instrumentation &
Control*
- *Computer Aided
Engineering*

Manufacturing Engineering

- *Process &
Production*
- *Materials*
- *Process Control*
- *Automation*
- *Product Design*
- *Information
Management*
- *Systems Integration*

Programme Structure (Mech Eng)

Semester I	Semester II	Inter sesi	Semester III	Semester IV		Semester V	Semester VI	Inter sesi	Semester VII	Semester VIII
KF1133 Pengenalan Kepada Kejuruteraan	KF1043 Asas Mekanik Gunaan	KF1131 Aplikasi Kejuruteraan	KF2033 Statistik Kejuruteraan	KF2043 Analisis Kompleks & Pers. Kebezaan Separat		KF3113 Pengiraan Berangka	KF3223 Teknologi & Peradaban	KF3065 Latihan Industri	KF4113 Pengurusan Kejuruteraan I	KF4123 Pengurusan Kejuruteraan II
KF1153 Sains Bahan	KF1063 Pengenalan Kejuruteraan Elektrik		KJ2113 Asas Mekanik Bendalir	KJ2323 Dinamik Kejuruteraan		KJ3313 Pengukuran & Instrumentasi	KJ3123 Mekanik Bendalir		KJ4013 Projek Ilmiah I	KJ4023 Projek Ilmiah II
KF1173 Grafik Kejuruteraan	KF1083 Pengenalan Termodinamik Kejuruteraan	VG (3 unit) Bahasa Inggeris untuk Jurutera	KJ2513 Bahan Kejuruteraan	KJ2343 Mekanik Bahan		KJ3143 Termodinamik Kejuruteraan	KJ3163 Pemindahan Haba		KJ4353 Getaran Mekanik	KJ4xx3 Elektif II
KF1193 Persamaan Kebezaan Biasa	KF1223 Aljabar Linear & Kalkulus Vektor		KL3003 Mesin & Elektronik Kuasa	KJ2723 Proses Pembuatan		KJ3333 Sistem Dinamik	KJ3343 Kejuruteraan Kawalan		KJ4953 Projek Reka Bentuk	KJ4xx3 Elektif III
ZT1012 Tamadun Islam & Kenegaraan Malaysia I	KF1243 Pengaturcaraan Komputer		PPU-U2 (3 unit) Kemahiran Berfikir & Komunikasi	ZT1022 Tamadun Islam & Kenegaraan Malaysia II		KJ3933 Reka Bentuk Komponen Mesin	KJ3943 Reka Bentuk Sistem		KJ4xx3 Elektif I	KJ4xx3 Elektif IV
H (1 unit) Ko-kurikulum					H (1 unit) Ko-kurikulum					

Programme Structure (Mfg Eng)

Semester I	Semester II	Inter sesi	Semester III	Semester IV		Semester V	Semester VI	Inter sesi	Semester VII	Semester VIII
KF1133 Pengenalan Kepada Kejuruteraan	KF1043 Asas Mekanik Gunaan	KF1131 Aplikasi Kejuruteraan	KF2033 Statistik Kejuruteraan	KF2043 Analisis Kompleks & Pers. Kebezaan Separa		KF3113 Pengiraan Berangka	KF3223 Teknologi & Peradaban	KF3065 Latihan Industri	KF4113 Pengurusan Kejuruteraan I	KF4123 Pengurusan Kejuruteraan II
KF1153 Sains Bahan	KF1063 Pengenalan Kejuruteraan Elektrik		KJ2113 Asas Mekanik Bendalir	KJ2323 Dinamik Kejuruteraan		KJ3313 Pengukuran & Instrumentasi	KP3023 Proses Pembuatan II		KP4913 Projek Ilmiah I	KP4923 Projek Ilmiah II
KF1173 Grafik Kejuruteraan	KF1083 Pengenalan Termodinamik Kejuruteraan	VG (3 unit) Bahasa Inggeris untuk Jurutera	KJ2513 Bahan Kejuruteraan	KJ2343 Mekanik Bahan		KP3213 CAD/CAM	KP3123 Teknologi Perkakas Mesin		KP4213 Pengautomatan & Robotik	KP4423 Perancangan & Kawalan Pengeluaran
KF1193 Persamaan Kebezaan Biasa	KF1223 Aljabar Linear & Kalkulus Vektor		KL3003 Mesin & Elektronik Kuasai	KP2023 Proses Pembuatan I		KP3233 Kuasai Bendalir	KP3223 Sistem Kawalan Automatan		KP4413 Projek Industri	KJ4xx3 Elektif II
ZT1012 Tamadun Islam & Kenegaraan Malaysia I	KF1243 Pengaturcaraan Komputer		PPU-U2 (3 unit) Kemahiran Berfikir & Komunikasi	ZT1022 Tamadun Islam & Kenegaraan Malaysia II		KP3413 Jaminan Kualiti	KP3423 Perancangan Kelengkapan & Pengendalian Bahan		KJ4xx3 Elektif I	KJ4xx3 Elektif III
H (1 unit) Ko-kurikulum					H (1 unit) Ko-kurikulum					

Course Structure (see KH4543)

1. Course Code
2. Course Name
3. Course Type
4. Goal and Summary of Course Content
5. Outcomes
6. Detail and Teaching Plan
7. List of Projects (Optional)
8. Credit Distribution
9. Evaluation Distribution
10. Evaluation method
11. Lecturer

Images of OBE

Work Schedule

		04							05							
No	Task	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Jul	Aug	
1	PEO & PO	█	█	█	█											
2	Programme Structure				█	█										
3	Detailed Course Design				█	█	█									
4	Course Outcomes					█	█	█								
5	Documentation								█	█	█					
6	Approval									█	█	█	█	█		
7	Implementation													█		
8	Assessment & Evaluation														█	



Apa peranan kita selepas ini?

Thank you

Wassalamualaikum

