# THE lean

FACULTY OF MANUFACTURING ENGINEERING

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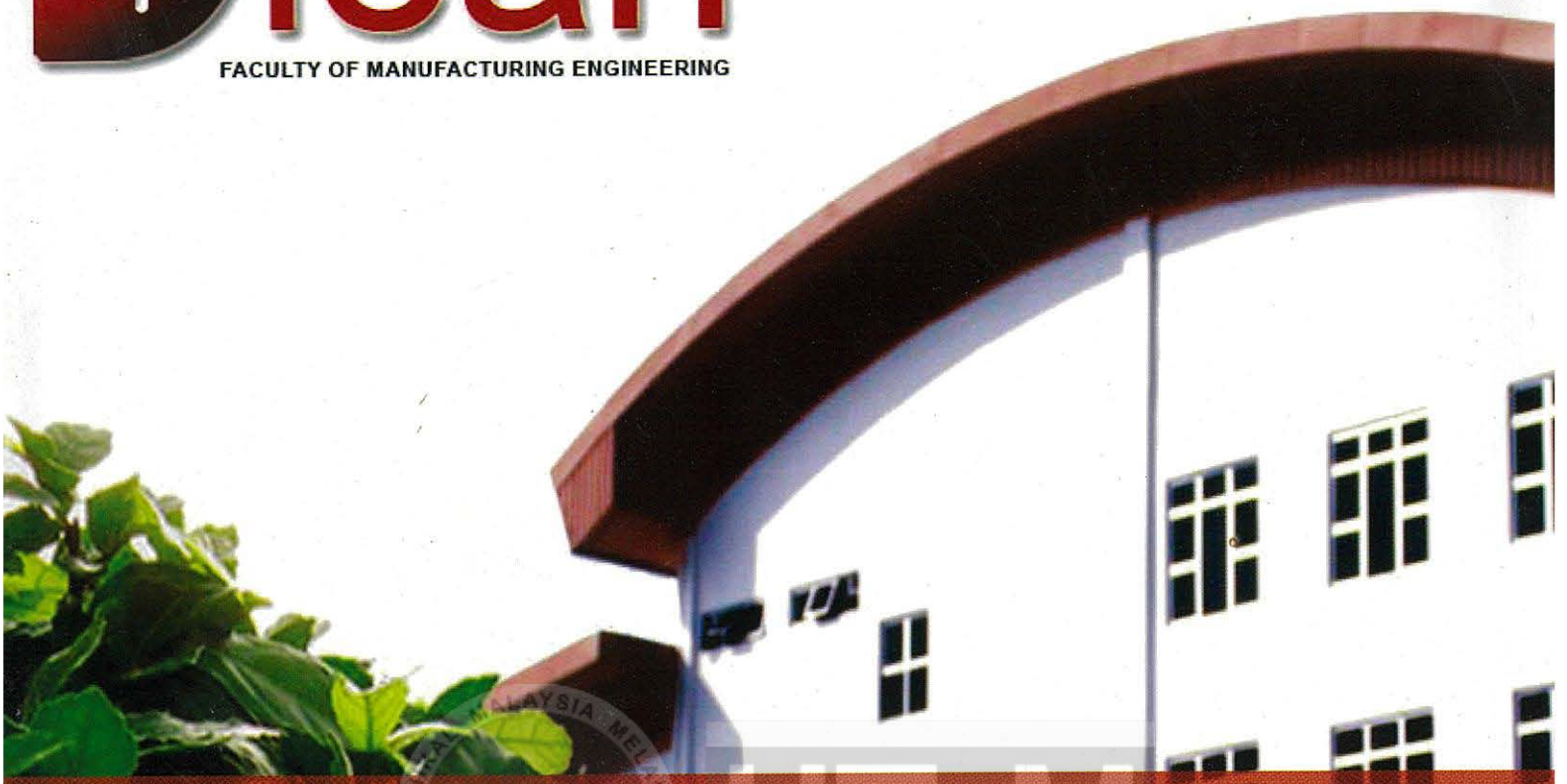

## PROFESSORIAL TALK BY PROF. DR MOHD RAZALI MUHAMAD

## ROBOCON 2009

## PROGRAM TAUTAN KASIH











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**Dr. Mohd Rizal Salleh**
...Dean, Faculty of Manufacturing Engineering

# dean's note

Assalamualaikum wrt w.b.t dan Salam Sejahtera.

Bersyukur kita ke hadrat Allah SWT kerana dengan limpah kurnia dan rahmatNya dapat kita bertemu kembali di dalam The Lean Edisi 4 yang yang bakal menceritakan rentetan aktiviti-aktiviti yang berlaku sepanjang 6 bulan pertama tahun 2009.

Fakulti telah merancang pelbagai aktiviti dan program sepanjang tahun ini bagi memenuhi KPI Pusat Tanggungjawab sekaligus untuk universiti amnya, namun semua yang dirancang ini adalah bertujuan untuk memenuhi misi dan visi fakulti bagi melaksanakan pengajaran dan pembelajaran kejuruteraan pembuatan yang berkualiti, serta penyelidikan dan perundingan yang perlu dilaksanakan secara berterusan.

Tahun 2009 turut menyaksikan aktiviti perpindahan kampus yang merupakan agenda penting yang melibatkan tiga lokasi utama iaitu; kampus industri , makmal Fasa B dan juga kampus induk di Durian Tunggal . Terima kasih dan syabas diucapkan kepada semua pihak yang telah bertungkus lumus dan memberi kerjasama sepenuhnya bagi memastikan kelancaran proses perpindahan tersebut.

Di kesempatan ini, saya ingin mengucapkan tahniah kepada Jawatankuasa Penerbitan di atas kelahiran The Lean Edisi 4 ini. Semoga buletin ini akan terus menjadi platfom kepada para pensyarah untuk mengasah bakat mereka dalam bidang penulisan dan penerbitan.

Saya juga ingin mengambil kesempatan ini untuk merakamkan ucapan ribuan terima kasih kepada mantan dekan, Y. Bhg. Profesor Dr. Mohd Razali Muhamad, di atas segala usaha yang telah beliau curahkan dalam membangunkan fakulti ini. Diharap beliau akan terus menyumbangkan idea dan tenaga beliau bagi mengukuh dan memantapkan perjalanan dan pengurusan fakulti.

Akhir sekali, harapan saya semoga fakulti kita akan terus maju dan cemerlang di masa hadapan. Kegemilangan tidak akan tercapai melainkan dengan kerjasama dan komitmen dari semua pihak.

Selamat Maju Jaya dan Terima kasih.


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# SYARAHAN UMUM PELANTIKAN PROFESOR

*Saifudin Hafiz Yahaya*

Pada 11hb Februari 2009 yang lalu, Fakulti Kejuruteraan Pembuatan (FKP) telah berjaya menganjurkan satu syarahan umum pelantikan profesor untuk Yang Berbahagia Prof. Dr. Mohd Razali Muhamad. Penganjuran syarahan umum ini adalah yang kedua kalinya dianjurkan oleh fakulti di mana penganjuran yang julung kali diadakan pada tahun 2007.

Antara tujuan penganjuran syarahan ini diadakan adalah untuk menyediakan satu wacana platform yang berguna kepada seorang profesor untuk berkongsi kepada umum tentang hasil pencapaiannya di dalam bidang akademik samada dalam penyelidikan mahupun aspek pengajaran dan pembelajaran seterusnya sumbangan-sumbangan lain beliau.

Pada hari tersebut, Prof. Dr Mohd. Razali telah menyampaikan syarahan yang bertajuk "Manufacturing Competitiveness: From Strategy to Process" bertempat di Auditorium, UTeM. Syarahan ini telah berjaya mendapat sambutan yang luar biasa di mana ianya telah dihadiri oleh seramai 200 orang tetamu dari dalam dan luar UTeM yang telah memenuhi di segenap ruang yang ada di dalam auditorium tersebut. Naib canselor, UTeM merupakan antara tetamu kehormat yang hadir. Di dalam syarahan tersebut, Prof. Dr. Mohd. Razali ada menekankan bagaimana kita dapat menstrategikan sesuatu perkara dengan jayanya sebelum pemprosesan strategi tersebut di laksanakan. Syarahan ini merupakan antara projek yang berjaya dianjurkan dengan gemilangnya oleh FKP dan diharapkan pada masa akan datang, FKP akan terus mantap sejajar dengan Pelan Strategik Pendidikan Tinggi Negara (PSPTN).

> "... kita dapat menstrategikan sesuatu perkara dengan jayanya sebelum pemprosesan strategi tersebut dilaksanakan.

# Robocon ABU Asia-Pacific Robot Contest 2009 MALAYSIA

## highlights

*Syamimi Shamsuddin & Mahasan Mat Ali*

Pertandingan ROBOCON yang menjadi program tahunan staf dan pelajar Jabatan Robotik & Automasi Fakulti Kejuruteraan Pembuatan (FKP) telah berlangsung dari 5 hingga 10 Mei 2009 yang lalu di Stadium Malawati, Shah Alam. ROBOCON adalah acara tahunan khusus untuk pelajar-pelajar institut pengajian tinggi awam dan swasta. Penyertaan pada kali ini merupakan penyertaan kali ke-5 untuk pelajar dari Jabatan Robotik & Automasi FKP.

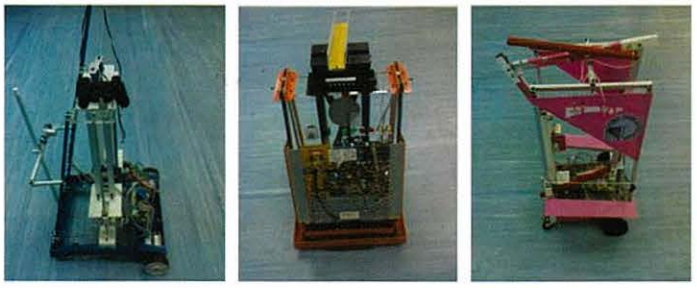
Tema pertandingan ROBOCON 2009 ialah 'Travel Together for the Victory Drums'.

*"Travel Together for the Victory Drums is a game based on an imaginary journey of olden days using the Kago palanquin. An Automatic Carrier Robot at the front and a Manual Carrier Robot at the rear shall cooperate to carry an automatic Traveler Robot in a Kago to the goal with the aim of completing the journey before the other team. Each match lasts for three minutes."*

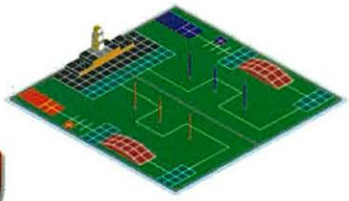
## Pasukan ROBOCON FKP

Untuk pertandingan Robocon 2009, FKP telah menghantar satu pasukan bagi menggalas cabaran kali ini. Keanggotaan pasukan ROBOCON 2009 terdiri dari 6 orang pelajar Tahun 1, 12 pelajar Tahun 2 dan 8 orang pelajar tahun akhir. Pasukan ini telah mula dibentuk sejak September 2008. Staf FKP yang terlibat aktif adalah En Mahasan Mat Ali, En Muhamad Asari Abdul Rahim, Puan Syamimi Shamsuddin dan En Shariman Abdullah.

Terdapat 3 buah robot yang telah dibina iaitu sebuah robot manual dan 2 robot berautonomi (*autonomous*). Ketiga-tiga robot ini adalah hasil Projek Sarjana Muda (PSM) pelajar Jabatan Robotik & Automasi sendiri.



(Kiri ke kanan) Robot Manual, Robot Automatik 1, Robot "Traveller" (Automatik)



## Amanat oleh Naib Canselor UTeM

Pasukan dari FKP amat berbesar hati kerana mendapat kunjungan hormat dari Yang Berbahagia Professor Dr. Ahmad Yusoff bin Hassan Naib Canselor UTeM sehari sebelum bertolak ke Shah Alam. Semasa lawatan tersebut, beliau sempat menyaksikan demonstrasi robot-robot yang akan dipertandingkan. Beliau turut menyampaikan amanat kepada kontinjen FKP agar dapat membawa pulang pencapaian terbaik dalam pertandingan tahun ini.

## Keputusan ROBOCON 2009

Pasukan dari FKP telah diundi dalam Kumpulan-H bersama-sama dengan 3 buah institusi pengajian tinggi yang lain. Keputusannya, pasukan FKP menang dalam perlawanan menentang Universiti Perguruan Sultan Idris (UPSI) dan kalah dalam baki 2 perlawanan lagi menentang Universiti Putra Malaysia (UPM) dan Institut Latihan Perindustrian Kota Bharu (ILPKB).

Ini menyebabkan FKP tidak layak ke pusingan seterusnya. Secara asasnya, persiapan ROBOCON 2009 adalah lebih baik jika dibandingkan dengan tahun-tahun yang sebelumnya. Namun faktor-faktor seperti kekurangan latihan, masalah teknikal dan faktor kelicinan gelanggang sebenar menyebabkan pasukan FKP gagal untuk ke pusingan suku akhir. Namun begitu, semangat jitu dan komitmen tinggi yang telah ditunjukkan oleh ahli-ahli pasukan wajar mendapat pujian. Diharapkan pasukan ROBOCON 2010 FKP akan dapat menjulang nama UTeM dengan kejayaan yang lebih membanggakan.

# PROGRAM TAUTAN KASIH

*Nurazua binti Mohd Yusop dan Wan Hasrulnizzam Wan Mahmood*

Program tautan kasih atau lebih dikenali sebagai program bakti siswa ini telah dilaksanakan dengan jayanya di Kampung Bukit Gemuroh, Mukim Tersat, Daerah Hulu Terengganu, Terengganu Darul Iman dengan disertai seramai 69 orang pelajar Fakulti Kejuruteraan Pembuatan, Universiti Teknikal Malaysia Melaka. Dengan tema Mahasiswa Gemilang, Negara Terbilang, program ini telah berlangsung dari 30 April hingga 4 Mei 2009.

Dengan kerjasama daripada pihak penganjur yang terdiri daripada Persatuan Pelajar Fakulti Kejuruteraan Pembuatan (SME), Universiti Teknikal Malaysia Melaka, Pejabat Daerah Hulu Terengganu (PDHT) dan JKKK Bukit Gemuroh, program ini dijalankan untuk memenuhi objektif- objektif seperti berikut:

- Memberikan pendedahan kepada mahasiswa tentang senario semasa berkaitan dengan perkembangan ekonomi dan sosial di desa.
- Menjalinkan ukhwah sesama pelajar FKP dan dengan masyarakat luar.
- Meningkatkan rasa tanggungjawab masyarakat kepada isu- isu kemasyarakatan.
- Memberi pendedahan tentang kehidupan universiti kepada generasi muda.

Dengan diringi oleh pensyarah pengiring iaitu Encik Tajul Ariffin Abdullah, Encik Mohd Shahir Kasim dan Encik Jeefferie Abd Razak, Penyelaras program, Encik Wan Hasrulnizzam Wan Mahmood, amat berpuas hati dengan pelaksanaan dan kejayaan program yang julung kali diadakan ini. Menurut beliau, di antaranya adalah; program ini telah meningkatkan kesedaran mahasiswa/wi terhadap peranan dan tanggungjawab mereka kepada masyarakat desa. Selain itu, program ini juga secara tidak langsung telah meningkatkan kemahiran insaniah dari segi kerja berpasukan, penyelesaian masalah, komunikasi, pemikiran kreatif, bertolak ansur dan motivasi diri. Di samping itu, program ini juga telah dapat menyuntik semangat kerjasama di kalangan mahasiswa/wi dengan masyarakat desa dan kesedaran terhadap pendidikan tinggi di kalangan masyarakat. Seterusnya, menerusi program ini juga, pelbagai respon positif telah diperolehi dari kedua-dua belah pihak iaitu mahasiswa/wi dan penduduk kampung Bukit Gemuroh terhadap Universiti Malaysia Melaka umumnya dan Fakulti Kejuruteraan Pembuatan khususnya.

*(Lagi gambar dan laporan di muka sebelah)*

STUDENT ACTIVITIES

# PROGRAM TAUTAN KASIH

*Norhidayah Muhamad Dahari – SME*

Pada hari Khamis, 30 April 2009, seramai 67 orang pelajar Fakulti Kejuruteraan Pembuatan termasuk 13 orang AJK SME telah mengikuti Program Tautan Kasih. Rombongan ini diiringi oleh 4 orang pensyarah pengirng iaitu En. Wan Hasrulnizzam Bin Wan Mahmood, En. Tajul Ariffin Bin Abdullah, En. Jeeferie Bin Abd. Razak dan En. Shahir Bin Kassim. Lawatan ini dianjurkan oleh Society of Manufacturing Engineers (SME) dengan kerjasama Fakulti Kejuruteraan Pembuatan dan Pejabat Daerah Hulu Terengganu. Objektif program ini adalah untuk mendedahkan kepada mahasiswa tentang perkembangan ekonomi dan sosial di desa. Selain itu program ini sekaligus meningkatkan rasa tanggungjawab masyarakat kepada isu-isu kemasyarakatan. Secara tidak langsung program ini memberikan pendedahan kepada generasi muda tentang kehidupan di universiti.

Kami telah memulakan perjalanan pada 30 April 2009 jam 10.00 malam dari Universiti Teknikal Malaysia Melaka (UTeM). Pihak UTeM telah menyediakan 2 buah bas untuk pengangkutan sepanjang program dijalankan. Dalam perjalanan kami telah singgah di Masjid Hulu Terengganu, pada 1 Mei 2009 jam 6.00 pagi untuk menunaikan solat subuh dan sarapan pagi. Kemudian kami meneruskan perjalanan pada jam 9.00 pagi dan kami tiba di Dewan Masyarakat Kg. Bkt. Gemuroh pada jam 10.00 pagi. Setibanya kami di Dewan Masyarakat beberapa persiapan dilakukan bagi upacara perasmian. Program ini telah dirasmikan oleh YB. Tuan Haji Mohd Nor Bin Othman (Ahli Parlimen Hulu Terengganu). Selepas upacara perasmian, mahasiswa diserahkan kepada keluarga angkat. Pada waktu petang pula program sukan telah diadakan di Padang Sekolah Kebangsaan Bukit Gemuroh dan diikuti sebelah malam program kerohanian di Masjid Kampung Bukit Gemuroh.

Pada keesokan harinya iaitu 2 Mei 2009, pada sebelah pagi kami melakukan aktiviti gotong-royong bersepadu penduduk bersama mahasiswa. Beberapa kumpulan telah diagihkan mengikut tugas yang diberikan. Jamuan untuk makan tengahari disediakan oleh mahasiswa dan penduduk melalui aktiviti kenduri kampung di Gelanggang Bola Tampar Kg. Bukit Gemuroh. Pada sebelah petang ialah program sukaneka mahasiswa bersama penduduk. Aktiviti ini dijalankan di Padang Sekolah Kebangsaan Bukit Gemuroh. Pada sebelah malam pula mahasiswa diberi peluang untuk meluangkan masa bersama keluarga angkat. Pada 3 Mei 2009, pada sebelah pagi, mahasiswa melibatkan diri dengan aktiviti bersama pelajar tingkatan 4 dan 5 SMK Tersat. Mahasiswa diberi tugas menjadi fasilitator kepada para pelajar dan berkongsi pengalaman belajar di universiti. Pada sebelah malam pula merupakan acara kemuncak program ini iaitu Malam Kebudayaan dan diikuti Majlis Perasmian Penutup. Majlis ini telah dirasmikan oleh YB. En. Rozi Bin Mamat (ADUN Kawasan Telemong).

Hari terakhir program ini iaitu 4 Mei 2009 merupakan hari perpisahan antara mahasiswa dan keluarga angkat. Suasana di perkarangan Masjid Kg. Bkt. Gemuroh kelihatan sayu. Tepat jam 10.00 pagi kami bertolak menuju ke Stesen TNB Kenyir. Lawatan ke stesen ini memberi pendedahan kepada kami tentang sistem janakuasa. Selepas melawat Stesen TNB Kenyir, aktiviti terakhir kami ialah berjalan-jalan di kawasan Bandar Kuala Terengganu. Tepat jam 3.00 petang kami bergerak pulang ke UTeM dan kami sampai di UTeM pada pukul 2.00 pagi.

# STUDENT ACTIVITIES















STUDENT ACTIVITIES

# KEM JATI DIRI SIRI 1 2009 KEM NUR LEMBAH PANGSUN

*Afiqah Bt Amran – SME*


Pada 27 Februari 2009 sehingga 1 Mac 2009 2009 telah diadakan KEM JATI DIRI SIRI 1 2009 di Kem Nur Lembah Pangsun, Ulu Langat, Selangor. Berikut adalah aktiviti-aktiviti yang telah dilaksanakan selama tiga hari.

**Hari Pertama : 27 Februari 2009 (Jumaat)**

Seramai 73 orang peserta Kem Jati Diri Siri 1 2009 serta 2 orang pensyarah pengiring (Encik Wan Hasrulnizam b Wan Mahmod dan Encik Yuhazri b Yaakob) telah mendaftar untuk mengikuti kem ini iaitu:

4 orang fasilitator
40 orang pelajar perempuan
29 orang pelajar lelaki
Encik Wan Hasrulnizam b Wan Mahmod
Encik Mohd Yuhazri b Yaakob

Kesemua peserta lelaki dan perempuan berkumpul di perkarangan Kampus Industri dan bas mula bertolak pada jam 10.00 pagi dengan dua buah bas membawa para peserta. Peserta tiba di Pekan Ulu Langat pada jam 12.30 tengah hari dan makan tengah hari di Pekan Ulu Langat. Peserta lelaki bersolat Jumaat di Masjid Ulu Langat pada jam 1.30 petang. Tepat jam 2.15 petang, kami tiba di Kem Nur Lembah Pangsun dan disambut oleh staf di sana. Selesai pembahagian khemah diadakan, kami memulakan pemasangan khemah di tapak perkhemahan yang disediakan. Terdapat 6 buah khemah yang diduduki oleh 4 orang peserta dan selebihnya 3 orang peserta satu khemah.

Acara petang itu bermula jam 5.00 petang dengan majlis perasmian oleh Encik Wan Hasrulnizam di Dewan Al- Hambra. Sedikit jamuan minum petang disediakan oleh pihak Nur Lembah Pangsun pada jam 5.30 petang. Sesi seterusnya dikendalikan oleh Ketua Fasilitator, Saudara Al- Amin serta semua fasilitator bagi slot 'Ice Breaking'. Makan malam disediakan pada jam 6.30 petang. Peserta bersiap sedia untuk berjemaah di surau Nur Lembah Pangsun selepas selesai makan malam. Aktiviti pertama pada malam itu diadakan di Dewan Al- Hambra sekali lagi. Sebelum memulakan slot pada malam itu, seorang Penghulu dan seorang Penghuluwati bagi mewakili peserta lelaki dan peserta perempuan. Atas undian para peserta, kami sebulat suara memilih Saudara Mohd Azfar b Mustafa dan Nor Asma bt Zainudin sebagai Penghulu dan Penghuluwati.

Bermula jam 8.30 malam, semua peserta dikumpulkan sekali lagi di Dewan Al- Hambra untuk menjalankan aktiviti 'indoor'. Tujuh buah kumpulan dibahagikan dengan setiap kumpulan terdiri daripada sembilan ke sepuluh orang ahli. Bagi memenuhi masa yang ada, lima jenis aktiviti diperkenalkan kepada kami. Bermula dengan tepukan tangan dan nyanyian lagu berpandukan belon yang diberi. Bagi menguji sikap kerjasama sesama ahli kumpulan, setiap ahli diberi sebiji belon dan memilih sebiji belon yang terbaik untuk ditampar kepada setiap ahli kumpulan. Kerjasama antara ahli akan membuatkan belon yang ditampar tidak akan jatuh. Seterusnya, setiap kumpulan diberi sepaket kacang untuk aktiviti seterusnya. Kesimpulan dari kacang tersebut, para peserta akan sedar bahawa, setiap kerja yang dilakukan tidaklah mudah seperti mengopek kacang. Aktiviti terakhir pada malam itu adalah membina penampan telur menggunakan straw agar telur yang dilepaskan tidak akan pecah.

Selesai kesemua LDK, sekali lagi kumpulan dirombak untuk diagihkan kepada 7 buah kumpulan lain. Setiap kumpulan masih terdiri daripada sembilan ke sepuluh orang. Setiap kumpulan diberi nama bertemakan ikan. Antara nama- nama ikan yang dipilih sebagai nama kumpulan ialah ikan araphaima, ikan kekek, ikak emas, ikan kelah, ikan haruan, ikan kaloi dan ikan sepat. Aktiviti pada malam tersebut tamat pada jam 12.30 pagi.

**Hari Ke Dua : 28 Februari 2009 (Sabtu)**

Jam 6.00 pagi, para peserta berkumpul di Dewan Al- Hambra untuk solat subuh berjemaah. Sedikit tazkirah pagi disampaikan oleh Saudara Al- Amin sebagai santapan rohani para peserta sebelum memulakan aktiviti yang mencabar. Sarapan pagi disediakan pada jam 7.15 pagi oleh pihak Nur Lembah Pangsun. Bagi aktiviti pertama, peserta dibawa masuk ke Hutan Simpan Ulu Langat untuk aktiviti Jungle Tracking. Peserta dipimpin oleh jurupandu yang bertauliah dari kem tersebut yang seramai empat orang. Pendakian sebelum tiba di jeram mengambil masa selama

sambil diberi peluang untuk membasahkan diri. Seorang peserta iaitu Nur Hamizah mengalami kecederaan pada kaki beliau. Sewaktu menuruni bukit, Hamizah dipimpin turun oleh AJK Kebajikan selepas diberi rawatan ringan. Kesemua peserta tiba di bawah semula pada jam 12.00 tengah hari. Jamuan makan tengah hari telah disediakan di dewan makan seperti selalu.

Jam 2.30 petang, aktiviti kedua dijalankan dengan aktiviti obstacle. Sebanyak lapan halangan ditempuh oleh para peserta. Setiap kumpulan dilepaskan satu persatu agar tidak berlaku pertembungan antara satu kumpulan dengan kumpulan yang lain. Selesai aktiviti obstacle, setiap kumpulan dilepaskan ke aktiviti seterusnya iaitu lake crossing. AJK Tugas- Tugas Khas turut membantu menjalankan aktiviti lake crossing ini bagi menambahkan lagi cabaran untuk menyeberangi tasik. Aktiviti pada petang tersebut tamat pada jam 6.30 petang. Para peserta terus ke dewan makan untuk makan malam dan seterusnya bersiap sedia untuk solat maghrib berjemaah.

Selesai solat, sedikit santapan rohani diberikan sekali lagi oleh Saudara Al- Amin. Tazkirah yang disampaikan berkisar isu Palestine dan Masjid Al- Aqsa. Tanggungjawab umat Islam ditekankan kepada semua peserta dan peranan sebagai umat Islam dalam membantu dan mengembalikan semula maruah Islam. Pada jam 8.30 malam, satu sesi ceramah oleh bekas pelajar UTeM iaitu Saudara Adib didatangkan khas untuk menceritakan pengalaman beliau semasa mencari kerja dan pengalaman beliau bekerja sekarang. Beliau kini sedang bertugas sebagai jurutera di syarikat Toyota. Aktiviti yang sepatutnya dijalankan pada jam 10.00 malam iaitu Night Walk terpaksa dibatalkan kerana keadaan cuaca yang tidak mengizinkan dan keadaan jalan yang licin. Slot malam digantikan dengan malam kebudayaan. Setiap kumpulan diwajibkan mengadakan persembahan dengan bertemakan ikan. Slot ini berjaya mengurangkan ketegangan dalam diri setiap peserta setelah penat pada siang hari dengan aktiviti- aktiviti berat. Slot malam tersebut berakhir pada jam 1.00 pagi. Semua peserta dibenarkan pulang ke khemah masing- masing. Namun demikian, peserta perempuan terpaksa berpindah ke dewan pada malam tersebut kerana khemah peserta dimasuki air.

**Hari Ke Tiga : 1 Mac 2009 (Ahad)**

Seperti hari-hari sebelumnya, para peserta bersolat subuh berjemaah di dewan dan tazkirah pagi disampaikan oleh Saudara Al-Amin. Sarapan pagi disediakan pada pagi itu pada jam 7.30 pagi sehingga 8.00 pagi. Bermula jam 8.30 pagi, para peserta berkumpul untuk aktiviti pada pagi tersebut iaitu flying fox. Peserta dilepaskan secara berpasangan dan ada juga yang bersendirian. Seterusnya, bagi peserta yang selesai melakukan flying fox, mereka membuat persembahan ringan bagi mengisi masa sambil menunggu peserta lain menyudahkan terjunan mereka. Flying fox tamat pada jam 10.30 pagi.

Jam 10.45 pagi, semua peserta berkumpul semula di Dewan Al -Hambra untuk majlis penutupan. Majlis ini dirasmikan oleh Encik Wan Hasrulnizam. Beliau turut merumuskan aktiviti sepanjang 3 hari 2 malam ini. Beliau mengucapkan tahniah dan terima kasih kepada semua yang telah menjayakan program kali ini. Seterusnya ucapan dari Penghulu dan Penghuluwati dan diikuti dengan ucapan dari semua AJK Kem Jati Diri ini yang dimulakan dengan Saudara Azril selaku Pengarah Program. Tidak ketinggalan ucapan dari Encik Yuhazri, para fasilitator dan Saudara Adib. Majlis penutupan taman pada jam 12.00 tengah hari. Para peserta bersurai ke khemah masing-masing untuk bersiap sedia untuk pulang. Makan tengah hari turut disediakan.

Bas UTeM tiba di perkarangan Kem Nur Lembah Pangsun pada jam 1.45 petang. Semua peserta berangkat pulang ke Melaka pada jam 2.30 petang selepas selesai mengemas dan membersihkan tapak khemah masing- masing. Kerjasama antara peserta membuktikan pelajar Universiti Teknikal Malaysia Melaka khususnya Fakulti Kejuruteraan Pembuatan ini amat bertanggungjawab terhadap kebersihan alam sekitar walaupun berada di tempat lain. Perjalanan mengambil masa selama hampir dua jam. Mereka tiba di kolej kediaman masing-masing pada jam 4.30 petang.

**RUMUSAN KESELURUHAN PROGRAM**

Pada keseluruhannya, program yang dirancang ini telah berjalan dengan lancarnya seperti mana yang telah diharapkan. Bermula hari pertama dijalankan sehinggalah hari terakhir dijalankan, semua peserta menunjukkan kepuasan yang melegakan hati ahli jawatan kuasa yang terlibat secara langsung dan tidak langsung. Peserta menunjukkan jati diri yang tinggi dalam setiap aktiviti yang dijalankan dan sikap yang ditunjukkan juga amat memuaskan. Masing- masing bertanggungjawab terhadap rakan masing-masing dan juga terhadap alam sekitar. Sikap toleransi yang ditunjukkan juga amat memuaskan. Bagi semua fasilitator, mereka telah melaksanakan tanggungjawab yang sehingga mencapai objekif seperti yang diharapkan. Aktiviti tidak hanya berfokuskan aktiviti lasak atau outdoor semata- mata malah, pengisian lain seperti ceramah, LDK dan persembahan turut menarik minat peserta kem untuk melibatkan diri sepenuhnya. Akhir sekali, harapan saya agar aktiviti seperti ini dapat dijalankan pada setiap sesi dan menaikkan semula nama SME yang agak tenggelam sejak kebelakangan ini.

# INDUSTRIAL VISIT

## IMPRESSIVE EDGE SDN. BHD.

*Associate Professor Chong Kuan Eng*

On the 11th of March 2009, 52 final year students from the Department of Manufacturing Management and 3 lecturers from the Faculty of Manufacturing Engineering participated in an industrial visit to Impressive Edge Sdn. Bhd. The company, located at the Cheng Technology Park, Melaka, specializes in precision engineering and machining for Mould, Die, I.C. Cavity, Trim and Form Die Set, Tungsten Carbide Precision Parts and precision spare parts fabrication. The company clientele includes leading MNCs in Malaysia, USA, Germany and China.

The purpose of the visit is to provide our students a firsthand experience of a real manufacturing environment, particularly in the area of high precision engineering and machining. We started off at about 2.30pm when everyone boarded the University bus for a 15 minutes ride to the company. The first agenda of the visit was a briefing on the company's background, products and activities. This was followed by the actual factory tour, where we were divided into 2 smaller but more manageable groups. Each group was shown around the various production areas. Since the company produces a variety of customized products in relatively small batches (high mix, low volume products), the production facility is compartmentalized into departments in a process layout configuration. We were briefed on the various processes, machines and also the complexities of high precision machining. The company prides itself with the capability to machine precision parts with complex geometries to an accuracy of ± 2 micron to ± 5 micron.

The students were exposed to both conventional and high speed, high precision machines which includes CNC machining centre, EDM, high precision grinding machines, cylindrical grinders and super drills to mention a few. The visit also provided some insights of the functions of the QC department of the company. A Q&A session followed after the factory tour and we headed back to campus at about 4.30pm. Feedbacks from the students indicated that the visit was most informative and it provided them with a wider perspective visit to their factory.

## PERUSAHAAN OTOMOBIL NASIONAL SDN. BHD. (PONSB)

*Nurazua binti Mohd Yusop*


Satu lawatan ke Perusahaan Otomobil Nasional Berhad (Proton Berhad) telah diadakan pada 19 Februari 2009 yang lepas. Lawatan ini telah disertai oleh Timbalan Dekan Akademik; En Ab Rahim Samsudin, Ketua Jabatan Rekabentuk Pembuatan; En Tajul bin Abdullah, Pn Nurazua binti Mohd Yusop, Pn Nur Aidawaty bt Rafan dan 2 orang pelajar dari Jabatan Rekabentuk Pembuatan. Walaupun tujuan utama lawatan ini adalah untuk pelajar tersebut mendapatkan data daripada pihak Proton Berhad untuk digunakan didalam Projek Sarjana Muda, namun di kesempatan itu, satu perbincangan juga telah berlangsung dengan jayanya. Pihak Proton Berhad memberi respon yang positif untuk memberi kerjasama dengan fakulti terutama di dalam bidang penyelidikan dan pembangunan. Disamping itu, peserta lawatan juga turut dibawa melawat ke 'production line' untuk mendapat pendedahan tentang suasana sebenar kilang automotif tempatan. Para peserta lawatan amat berpuas hati dan berharap supaya program lawatan seperti ini dapat dianjurkan lagi pada masa hadapan.

# INDUSTRIAL VISIT

## LAWATAN JABATAN ROBOTIK & AUTOMASI KE CAIRO, UTM

*Syamimi bt Shamsuddin*


Center for Artificial Intelligence and Robotics (CAIRO) yang terletak di Kampus Bandar UTM Jalan Semarak telah ditubuhkan 12 tahun yang lalu dan kini menjadi pelopor penyelidikan dan pembangunan dalam bidang kecerdikan buatan, robotik dan automasi di negara ini.

Di atas reputasi inilah 6 orang pensyarah dari Jabatan Robotik & Automasi (R&A) telah mengadakan lawatan ke CAIRO pada 14 Mei 2009 lalu. Lawatan ini diadakan dengan hasrat untuk memperkenalkan Jabatan Robotik & Automasi FKP kepada pihak Universiti Teknologi Malaysia (UTM), khususnya CAIRO sendiri. Lawatan ini juga bertujuan mendapatkan kerjasama, tunjuk ajar dan bimbingan dari CAIRO berkenaan aspek penyelidikan dalam bidang robotik dan automasi. Ini kerana jabatan R&A yang masih 'mentah' dan baru ditubuhkan selama 6 tahun amat mengalu-alukan kerjasama dengan pusat penyelidikan tersohor seperti CAIRO.

Semasa kunjungan ini, Dr Zamberi Jamaludin selaku Ketua Jabatan telah membentangkan sejarah penubuhan Jabatan R&A di UTeM, aktiviti penyelidikan jabatan serta subjek-subjek khusus jabatan yang ditawarkan untuk pelajar diploma dan Sarjana Muda di FKP.

Pihak CAIRO amat berbesar hati dengan lawatan ini dan rombongan dari Jabatan R&A telah disambut sendiri oleh Prof. Dr. Marzuki Khalid, Timbalan Naib Canselor (Penyelidikan & Inovasi) Universiti Teknologi Malaysia.

Berkenaan isu kerjasama, CAIRO telah mencadangkan agar selain dari menjalankan geran penyelidikan bersama CAIRO-UTeM, Jabatan R&A juga dipelawa untuk menghantar seorang staf untuk menyambung penyelidikan di peringkat PhD di CAIRO. Sememangnya jalinan usahasama yang erat antara UTeM dengan pihak CAIRO di masa akan datang dijangkakan dapat melahirkan projek penyelidikan dan juga cendekiawan yang disegani di Malaysia dan peringkat antarabangsa.

## PETRONAS PENAPISAN MELAKA SDN BHD

*Nur Aidawaty Rafan*

Satu lawatan industri ke Petronas Penapisan Melaka Sdn Bhd di Sg Udang, Melaka telah diadakan pada 7 Januari 2009 yang lalu. Lawatan singkat ini telah disertai oleh sebilangan pelajar 4 BMFA yang menjalankan projek sarjana muda di bawah seliaan Pn Nur Aidawaty Rafan dan Pn Silah Hayati Kamsani. Pelajar-pelajar ini telah diiringi oleh 4 orang pensyarah dari Jabatan Robotik dan Automasi dan Jabatan Rekabentuk Pembuatan. Tujuan utama lawatan ini adalah untuk memberi pendedahan tentang situasi sebenar di dalam industri minyak dan gas, dan kepentingan dan proses sistem kawalan di dalam bahagian COGEN, 'utility' dan 'sulphur recovery unit'

Sesi lawatan ini dimulai dengan sedikit taklimat operasi yang dijalankan oleh Petronas Penapisan Melaka Sdn Bhd dan syarikat gergasi Petronas secara umumnya yang telah disampaikan oleh En Mokhtar, Bahagian Sumber Manusia. Kemudian, ceramah berkenaan 'Penggunaan Instrumentasi dan Kawalan di Petronas Penapisan Melaka' telah disampaikan oleh En Fauzi, jurutera instrumentasi di unit COGEN selama 20 minit. Sejurus selepas itu, rombongan lawatan telah dibawa ke unit COGEN dan 'sulphur recovery' untuk melihat dengan lebih dekat lagi sistem dan operasi unit tersebut. Dalam masa yang sama, sedikit penerangan ringkas telah diberikan oleh En Muhammad Izzat selaku jurutera operasi di COGEN tentang apa itu 'gas turbine generator' dan 'steam turbine generator' yang merupakan komponen penting di dalam sistem COGEN. Semasa sesi lawatan ini dijalankan, pelajar-pelajar kelihatan teruja mendengar penerangan yang diberikan oleh jurutera-jurutera di sana dan aktif bertanyakan soalan-soalan yang berkaitan. Sesi lawatan ini telah diakhiri dengan sesi bergambar di lobi bangunan PPMSB bersama jurutera-jurutera yang terlibat. Semoga lawatan industri sebegini dapat diteruskan dengan harapan dapat membina keyakinan pelajar-pelajar agar terus berdaya saing dan menambah pengetahuan sedia ada.

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## SEMINAR PEMBUATAN OLEH PROFESOR BERNARD HON, UNIVERSITY OF LIVERPOOL

*Muzalna binti Mohd Jusoh*

Bertarikh 11 Jun 2009, bertempat di Auditorium UTeM, Fakulti Kejuruteraan Pembuatan telah menganjurkan Seminar Pembuatan yang disampaikan oleh Profesor Bernard Hon daripada University of Liverpool dengan jayanya. Seminar yang dihadiri oleh ahli akademik IPTA/S, wakil-wakil industri, wakil-wakil dari agensi kerajaan dan orang awam ini merupakan antara usaha universiti dalam memperkenalkan UTeM ke persada antarabangsa di samping tempatan.

Pengerusi program, Dr. Mohd Rizal bin Salleh menyatakan antara lain objektif seminar ini adalah untuk;

i) Menyediakan platform kepada seseorang profesor dari universiti terkenal antarabangsa menyampaikan kepada warga akademik hasil pencapaian dan kecemerlangan beliau di bidang akademik.
ii) Menghebahkan kepada industri dan institusi pengajian tinggi awam dan swasta mengenai kepakaran yang ada pada diri pembentang untuk mewujudkan jalinan kerjasama yang mantap.
iii) Menggalakkan profesor dan staf akademik lain untuk terus aktif melaksanakan aktiviti penyelidikan dan meningkatkan profesionalisme diri.

Diharapkan seminar ini menjadi wadah kepada para ahli akademik untuk terus berusaha dalam penyelidikan dan penerbitan bahan ilmiah serta sumbangan masyarakat.

## "PC BASED CONTROL: THEORY AND APPLICATION IN INDUSTRY"

*Nur Aidawaty Rafan*

Sebagai pendedahan kepada pelajar tentang apa itu kawalan berasaskan komputer peribadi atau 'PC Based Control' serta kegunaannya , satu ceramah telah diadakan pada 25 Februari 2009 bertempat di Bilik Kuliah 17, Kampus Industri. Ceramah ini telah disampaikan oleh En Tam Ji How. Beliau merupakan pengurus di AI Automation Sdn Bhd, Seremban dan sangat berpengalaman di dalam bidang 'PC Based Control' dan 'PLC'. Secara asasnya, ceramah yang telah diadakan selama 2 jam ini bertujuan:

- Memberikan pendedahan kepada para pelajar tentang asas dan aplikasi "PC Based Control"
- Memberi peluang kepada para pelajar untuk berdiskusi secara terus dengan penceramah jemputan dari industri agar pelajar dapat menambah keyakinan untuk terus berjaya dalam pengajian mereka.
- Mewujudkan kerjasama dan hubungan mesra antara fakulti dan industri, yang seterusnya dapat memberikan faedah bersama.

Di akhir ceramah ini, penceramah telah menunjukkan demo ringkas tentang aplikasi PC Based Control di dalam penggunaan 'Touch Screen monitor'. Hasil daripada demonstrasi dan penerangan ringkas tentang PC based Control, sebilangan pelajar telah tertarik dan ingin mengetahui dengan lebih lanjut tentang aplikasi teknologi ini. Justeru, inisiatif sebegini haruslah diteruskan supaya menjadi aktiviti yang mesti diadakan bagi mengukuhkan kefahaman pelajar tentang sesuatu topik atau subjek.

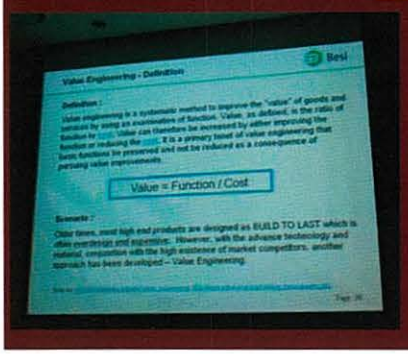
# INDUSTRIAL TALK

## VALUE ENGINEERING

*Associate Professor Chong Kuan Eng*

The Manufacturing Management Department of the Faculty of Manufacturing Engineering organized a talk on Value Engineering at 2pm, 26 March 2009 at the UTeM's Auditorium in the Durian Tunggal Campus. The event was coordinated by Associate Professor Chong Kuan Eng and was attended by all final year students from the department. The invited speaker was Dr. Bong Cheng Siong, Senior Manager (Productivity & Quality Management) from Besi APac Sdn. Bhd. Dr. Bong previously held senior positions with Infineon Technologies (Malaysia) Sdn. Bhd, and Creative Cubic Electronics (M) Sdn, Bhd. Besi Apac Sdn. Bhd., located in Shah Alam is a subsidiary of BE Semiconductor Industries , Netherlands and is leading manufacturer of specialized equipment for the semiconductor industry.

The primary objective of the talk was to introduce the concept of Value Engineering to our students and more importantly to provide a clearer understanding of its implementation in Besi APac. Secondary objectives are to introduce the BESI group of companies and to offer career opportunities to UTeM's graduates. The talk also created opportunities for potential R&D collaboration between UTeM and the comapny. The Manufacturing Management Department believes that such event is beneficial for both students and the faculty and will undertake to organize more industrial talks in the future.




## THE CHALLENGES IN MANUFACTURING METROLOGY

*Mohammad Kamil Sued*

On 12 March 2008, an Industrial Talk was organized by the Department of Manufacturing Process and System . The event took place at BK5 and BK6, UTeM industry campus, Ayer Keroh from 2:30 pm to 4:30 pm. The speaker, Seah Leong Ho was invited from the Sendi Mahir Sdn. Bhd. He is currently holding the position of quality manager and executive director of that company. The company is establish in 1995 and offers calibration and training services for most measurement instruments. The objectives of the talk are:

- To introduce the application of Manufacturing Metrology in industry.
- To expose the students regarding challenges in working environment.
- To promote the collaboration between industry and university.

Students that register DMFD 3542 – Engineering Metrology semester 1 2009/2010, attended the talk as one of the compulsory components of this subject. Some of the lectures form Manufacturing Process and System also present during the talk. The talk was chaired by Mr. Nor Alif Ikhwan student from 3DMF. After the greetings speech delivered by Mr. Mohammad Kamil Sued as the lecturer for DMFD 3542 –Engineering Metrology and the project leader of the talk, Mr. Seah Leng Ho presented his presentation. The presentations were divided to three sections that are Metrology, Measurement and Calibration. The presentation is able to attract the attention of the participant. At the end of the talk, Mr. Mohammad Kamil Sued gave the souvenirs to Mr. Seah Leng Ho and refreshment was served.

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# CERAMAH KERJAYA JABATAN PROSES

*Mohd Ridzuan Jamli*

Pada 28hb Mac 2009, Jabatan Proses Pembuatan telah menganjurkan satu Program Khidmat Masyarakat iaitu 'Ceramah Kerjaya' di Auditorium, Tingkat 1, Bangunan Canselori, Durian Tunggal (ceramah) dan Makmal Fakulti Kejuruteraan Pembuatan Fasa B (Pameran). Program ini dianjurkan untuk 100 orang pelajar-pelajar tingkatan 4 dari Sekolah-sekolah Menengah terpilih dari seluruh Melaka. Sekolah-sekolah yang menyertai progam tersebut adalah Sekolah Berasrama Penuh Integrasi Selandar, Sekolah Menengah Teknik Jasin, Sekolah Menengah Kebangsaan Bukit Katil, Sekolah Menengah Teknik Melaka Tengah, Sekolah Menengah Teknik Datuk Seri Mohd Zin, Sekolah Menengah Kebangsaan Dato' Dol Said, Alor Gajah, dan Sekolah Menengah Kebangsaan Haji Talib Karim.

Objektif ceramah kerjaya ini adalah untuk memberikan penerangan kepada pelajar-pelajar mengenai peluang kerjaya yang boleh diperolehi di bidang kejuruteraan di samping memupuk minat para pelajar dalam bidang kejuruteraan terutamanya kejuruteraan pembuatan khususnya proses pembuatan. Progam ini juga bertujuan untuk memberikan garis panduan kepada para pelajar untuk membuat pemilihan kursus yang bersesuaian dengan kelayakan dan minat mereka.

Program ini dapat memberikan pendedahan awal berkaitan dengan pemilihan kursus di IPTA yang sangat diperlukan oleh para pelajar yang bakal menduduki peperiksaan penting khasnya seperti Sijil Pelajaran Malaysia. Dengan adanya pendedahan ini, pelajar dapat merancang dengan lebih tepat bidang yang mereka minati dan seterusnya meningkatkan motivasi pelajar untuk berusaha dengan lebih tekun dan gigih untuk mencapai matlamat mereka. Pendedahan sebegini juga mampu membuka mata para pelajar untuk mempunyai hala tuju hidup yang lebih jelas di bidang kejuruteraan. Di samping itu, program ini juga menjadi salah satu platform untuk mempromosikan Universiti Teknikal Malaysia Melaka (UTeM) supaya menjadi universiti pilihan para pelajar.

Penganjuran Program Khidmat Masyarakat sebegini oleh pihak fakulti adalah penting bagi menyampaikan maklumat dan berkongsi ilmu dengan para pelajar sekolah supaya tidak ketinggalan dalam proses mendapatkan ilmu yang terbaik untuk memajukan diri mereka sejajar dengan pembangunan negara. Di samping itu, program ini menjadi salah satu sumbangan oleh pihak akademik dalam menaikkan tahap pendidikan setiap pelajar yang bakal menjadi peneraju negara di masa hadapan. Oleh itu, diharap program seumpama ini dapat diteruskan pada tahun akan datang.

## CERAMAH KERJAYA UNTUK PELAJAR TAHUN AKHIR BMFP

*Dr. Lok Yian Yian*

Ceramah kerjaya untuk pelajar tahun akhir BMFP anjuran Jabatan Proses Pembuatan telah diadakan pada 14 Mac 2009 di Bilik Kuliah 5, Bangunan Akademik, Kampus Industri UTeM. Dua orang pengurus di industri telah dijemput sebagai penceramah, iaitu En. Nor Azham bin Baharin (General Manager, CTRM Aero Composite Sdn. Bhd.) dan En Mohd Sabri Mohamad Zin (R & D Manager, Infineon Technologies (Malaysia) Sdn. Bhd).

Antara objektif ceramah ini adalah:
Memberikan pendedahan kepada pelajar tahun akhir tentang peluang-peluang dan skop-skop pekerjaan yang ada di industri khususnya dalam bidang pembuatan, memberikan pendedahan kepada pelajar tentang kualiti graduan yang diperlukan oleh industri supaya pelajar boleh membuat persediaan awal sebelum menceburi dunia pekerjaan, dan memberikan pendedahan kepada pelajar tentang kesan krisis ekonomi terhadap industri pembuatan di negara ini.

Seramai 38 orang pelajar telah menyertai ceramah kerjaya ini. Program ini telah memberikan pendedahan kepada pelajar yang bakal menamatkan pengajian tentang peluang-peluang pekerjaan dan jawatan yang ada di industri pembuatan di negara Malaysia. Pelajar juga didedahkan sifat-sifat dan ciri-ciri graduan yang diharapkan oleh pihak industri, di samping ciri-ciri resume yang baik. Dengan adanya input ini, pelajar dapat membuat persediaan awal sebelum memohon pekerjaan. Di samping itu, program ini juga memberi peluang kepada staf dan pelajar untuk berinteraksi dengan penceramah dari industri.

Secara keseluruhannya, program ceramah kerjaya ini telah berjaya dijalankan. Ia merupakan program yang amat diperlukan oleh pelajar tahun akhir yang bakal menceburi diri dalam dunia pekerjaan sebenar. Dua orang penceramah telah berkongsi pengalaman pekerjaan bermula dari seorang jurutera menjadi pengurus kilang yang terkemuka. Ini dapat memotivasikan pelajar supaya mempunyai hala-tuju dan cita-cita yang tinggi.

# ORIGINS OF LEAN PROCESS MANAGEMENT

**Ir. Dr. Punesh**

The basic principles of Lean Process Management originated in the Japanese manufacturing industry. The concept of Lean thinking made its entry into the Japanese industry in 1950's, when Eiji Toyoda, a young Japanese engineer, started implementing an opposite version of the manufacturing process practiced in USA.

Eiji Toyoda was the former president and chairman of the Japanese auto major, Toyota Corporation and he is only regarded as the one who through his leadership skills or management functions or organizational practices made Toyota a profitable organization, helping it to gain worldwide prominence. Eiji Toyoda, after completing his engineering degree at the Tokyo Imperial University, joined his cousin Kiichiro Toyoda who at that time has established an automobile plant called Toyoda Automatic Loom Works in Nagoya, Japan.

As the first task, Kichiro asked Eiji to oversee the construction of a new factory on the outskirts of Nagoya, which only in course of time became the "mother factory" for all Toyota Motor production facilities worldwide, getting the name "Toyota City". Impressed by Eiji's management skills in the construction of the factory, Kichiro made him the Managing Partner and asked him to study the American auto industry to learn and optimize their own functioning. So, Eiji Toyoda visited American auto major, Ford's River Rouge Plant in Michigan in early 1950s exploring "some possibilities to improve the production system" (Womack *et al.*, 1990).

Toyoda was searching for a means to make his fledgling manufacturing enterprise more competitive among the more than 80 automobile firms starting up in Japan's reconstructing post-war economy. (Brockberg 2008). Even though, he was impressed by the scale and automation of the infrastructure, he was thoroughly dismissive of Ford's manufacturing practices and functioning. So, after his return to Japan, he and a veteran loom machinist by the name Taiichi Ohno fine-tuned Toyota's own manufacturing practices and operations, based on the inefficiencies he witnessed in Ford's plant. That is, he concluded that Ford's system of mass production would not work out in their manufacturing plants in Japan and so he came up with new operational innovations, which only evolved into later day lean process management. "His observations led to innovations for (1) reducing the time for manufacturing processes by standardizing practices and (2) also maximizing value by eliminating, as much as possible, the waste of both material and human resources. Eventually, (3) empowered employees participated regularly in small-group strategic planning sessions (Kaizen events) to further streamline processes and reduce waste." (Brockberg, 2008). This standardization of operational practices, focusing on the value and the optimization of worker empowerment is known as the Toyota Production System, generically defined as lean. These successful Lean practices of Toyota quickly spread to other Japanese industries, as many Japanese industrialists adopted it.

Although these operational practices were visible in the Japanese industry for around 60 years, it made its entry into USA only in 1980's courtesy of Massachusetts Institute of Technology, Boston. That is, in 1984, MIT launched an international study into the production of motor vehicles all over the world. The researchers mainly focused on the significant paradigm shift in the Toyota Production System from the mass production methods, which were practiced by Ford and other American automobile majors. At the end of the study, the MIT research team came to the conclusion that lean manufacturing is "Japan's secret weapon" (Womack, et al., 1990) and in course of time should revolutionize Western industry, if it was adopted by them. They concluded, lean production is a superior way for humans to make things. It provides better products, in wider variety at lower cost. Equally important, it provides more challenging and fulfilling work for employees at every level, from the factory to headquarters. It follows that the whole world should adopt lean production, and as quickly as possible (Womack, et al., 1990).

With the Toyota's operational practices being implemented in other parts of the world in 1980's, the English term for these practices was first coined by Professor James P. Womack and consultant Daniel T. Jones in 1990 in the book, The Machine That Changed the World . Only after the exposure given by these two experts regarding the Toyota's operational practices, their coining of the term and importantly their efforts to introduce those practices in American industries, the lean process management became known worldwide. That is, Womack and Jones after publishing the book and bringing the lean process management in the limelight, embarked on a tour of North America, Europe and Japan to convince the organizations about the benefits of lean process management and by stating how mass production has become out of date. They even formed a well spread out network of organizations and individuals, who are dedicated to the promotion of lean production

Floor identification. Which colour has a meaning. Very clear floor.



**References**

Brockberg, K. H. 2008. Lean Schools: Origins and Elements of Lean: A Brief Review of the Literature. *White Paper School-lean#3. Pawley Institute for Learning* Access at http://www4.oakland.edu/upload/docs/Pawley/White Paper Origins and Elements Lit Review 031708rc.pdf (Retrieved on November 26, 2008).

Womack, J.P., Jones, D.T., and Roos, D. 1990. *The Machine that Changed the World*. Emerald Group Publishing Limited.

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# DO YOU KNOW WHAT IS LEAN MANUFACTURING?

**Effendi Mohamad**

## 1.0 INTRODUCTION

### 1.1 THE HISTORY

Taiichi Ohno and Shigeo Shingo developed and implemented Lean Manufacturing at Toyota over a period of 20-30 years. Their approach provides a mental model for other implementations. Ohno first visualized an ideal production system, in terms of workflow. Ohno's ideal system was inspired Eiji Toyoda's observations at Ford Motor Company. The ideal production system was a series of adjacent workstations that were balanced and synchronized with no inventory between stations. It delivered finished product to the customer exactly when needed (Just In Time) and drew materials, Just In Time. The resulting elements of Lean Manufacturing are aim at eliminating (or at least reducing) the reasons for inventory. While the real goal is to eliminate waste, Ohno understood that inventory mirrors waste.

In 1990 James Womack wrote a book called *"The Machine That Changed The World"*. Womack's book was a straightforward account of the history of automobile manufacturing combined with a study of Japanese, American, and European automotive assembly plants. What was new was a phrase *"Lean Manufacturing"*. Lean Manufacturing caught the imagination of manufacturing people in many countries. Lean implementations are now commonplace. The approach to Lean Manufacturing emphasizes phases of:

1. **Stability**
   Smooth in operations flow such as communications between top management, middle management and the operators.

2. **Continuous Flow**
   Smooth product flow from raw materials to finish good product and delivery to customer.

3. **Standardized Work**
   Standard motion which is recognized through standard operating time for both machine and human.

4. **Pull Systems**
   Production operations only response to demand from their customers. Two types of customer;

   i. Internal customer – within the production lines which is the later process.
   ii. External customer – the end users.

5. **Level Production**
   Balance in production line output versus time.

6. **Continuous Improvement**
   Non-stop continuous improvement activities for better results in production which corresponded to company vision and missions.

### 1.2 DEFINITION OF LEAN MANUFACTURING

Lean Manufacturing is an operational strategy oriented toward achieving the shortest possible cycle time by eliminating waste. It is derived from the Toyota Production System and its key thrust is to increase the value-added work by eliminating waste and reducing incidental work. The technique often decreases the time between a customer order and shipment, and it is designed to radically improve profitability, customer satisfaction, throughput time, and employee morale. The benefits generally are lower costs, higher quality, and shorter lead times. Therefore, Lean Manufacturing can be defined as;

*"A systematic approach to identifying and **eliminating waste** (non-value-added activities) through **continuous improvement** by allowing the product to flow in response to the pull of the customer in pursuit of perfection."*

### 1.3 THE SEVEN FORM OF WASTES

Initially, the first seven (7) wastes had been described by Mr. Ohno which is based on the Toyota Production System are:

**Overproduction** such as early production producing over customer orders and producing unordered materials / goods.

**Waiting** which means hanging around that brings to idle time (time when no value is added to the product).

**Transportation handling more than once** would delay the moving materials and it also means unnecessary moving or handling.

**High inventory** means unnecessary raw materials in stores, work in process (WIP), & finished stocks.

**Unnecessary motion**s are the movement of equipment or people that has no value to the product.

**Over-processing** which is an unnecessary processing or procedures (work carried out on the product which adds no value).

**Defective** units producing or reworking scrap which have low/ poor quality level.

However, through the experiences from the non-Japanese companies, they determined one more source of waste while implementing the Lean Manufacturing concept which is known as **unnecessary required skills** or **underutilising people**. Redundancy in job scope would result underutilising people in an organisation. These people would idle but the company still has to include them as part of the labour cost.

### 1.3.1 Overproduction

Often caused by quality problems, companies knows that it will lose a number of units along the production process so they produces extra to make sure that the customer order is satisfied. Overproduction has been said by some to be the worst of the seven wastes in a production.

**Characteristics:**

Making batches larger than the customer needs.
Making product ahead of schedule.

**Benefits of eliminating overproduction:**

Prevents "manufacturing at risk" ahead of customer schedule.
Saves money.
Uncovers the real problems in manufacturing.

### 1.3.2 Waiting

Products waiting around in factories either as finished goods or work in progress (WIP) are another major cause of waste. WIP is commonly caused by producing large batch sizes.

**Characteristics:**

Tends to occur where there is a poor balance of work, variation in cycle times or machinery requiring constant monitoring.

**Benefits of eliminating idle time:**

Better utilisation of operator time.
Better utilisation of equipment.
Less operator boredom.

### 1.3.3 Transportation handling more than once

Factory layouts can often be the fundamental cause of excess transportation. Excess inventory levels can also lead to wasted handling.

**Characteristics:**

Can be caused by excessive inventory, poor factory layout and inappropriate positions for raw materials.

**Benefits of reducing transportation:**

Reduced cost of handling equipment.
Less traffic in gangways.
Reduced risk of handling damage.

### 1.3.4 Unnecessary Motion

Lean manufacturing identifies excess motion as non value adding. How many times a person has to move in their day to day operations? How much of time is actually spent in value adding in comparison with the movements which does not adds value?

**Characteristics:**

Excessive stretching or walking for tools, components or sub-assemblies.
Often caused by a badly organised work environment.

**Benefits of eliminating operator motion waste:**

Better operator environment.
Less work related injuries and absence.
More productive work environment.

### 1.3.5 Over-processing

Over Processing is due to poor tool or product design creating activity. Rework is a typical example of over processing. Causes for processing waste include:

- Product changes without process changes.
- True customer requirements undefined.
- Over processing to accommodate down-time.
- Lack of communications.
- Redundant approvals.
- Extra copies/excessive information.

**Characteristics:**

Excessive time spent on set ups or down-time.
Unnecessary processes.
Overcomplicated processes.

**Benefits of eliminating process waste:**

Eliminate cost of unnecessary processes.
Improved flow through lines or cells.
Increased availability of machinery.

### 1.3.6 Defective units

Defectives units are caused by quality related issues. Making defective products is pure waste. Causes of processing waste include:

- Weak process control
- Unbalanced inventory level
- Deficient planned maintenance
- Inadequate education/training/work instructions
- Product design

**Characteristics:**

Large containers for collecting reject or defect parts.
High levels of overtime to meet customer demand.
Low confidence in production schedules.

**Benefits of eliminating bad quality:**

Improved customer satisfaction.
Lower costs of rework and waste disposal.
Improved capacity and ability to meet production schedules.
Less overtime.

### 1.3.7 Under utilizing People

Under utilizing people means not taking advantage of people's abilities. Causes of people waste include:

- Low or no investment in training.
- Low pay, high turnover strategy.

In summary, nearly every waste in the production process can fit into at least one of these categories. Lean manufacturing is an approach that eliminates waste by reducing costs in the overall production process, in operations within that process, and in the utilization of production labor. The focus is on making the entire process flow, not the improvement of one or more individual operations.

TECHNICAL ARTICLE

# THE LEVEL OF ACHIEVEMENT OF LEAN MANUFACTURING IMPLEMENTATION STATUS BEFORE & AFTER DEVELOPMENT OF KPIs AT AN AEROSPACE MANUFACTURING

**Effendi Mohamad**

## Introduc

The gr mpetition have ue businesses around the v fficult and complicated than before. Every comp ave tried to search for a solution to make them survive an r making their business remain successful and being competitive.

For manufacturing companies, it has become more complex and complicated. To survive in this competition, companies have been struggling to improve their streamline business process, inventories, cycle times and factors related to cost. Factors related to cost involves reducing the manufacturing costs, strengthen relationships with the suppliers, offering variety of product and most importantly to reduce the response time to their customer needs and expectations. It has been estimated that almost 50% of manufacturing costs are attributed to purchase items, the raw material account for 80% of a finished product's lead time and 30% of its quality problems [1-2]. All of these are actually driven by the economic needs. Moreover, if that manufacturing company manage to be successful and competitive to overcome all of these problems, it will bring them more customer demands.

However, many manufacturing companies nowadays are in different situation due to few problems they are facing which include excessive inventories, non-competitiveness, losing the market share and unable to cater to the customers' needs on time.

Therefore, many manufacturing companies try to search for a system that can make their process more effective to overcome these problems. Over two decades there have been numerous manufacturing "revolutions", accompanied by clarion calls for universal adoption of some new paradigm such as Manufacturing Resources Planning (MRPII), Just in Time (JIT), Optimized Production Technology/Theory of Constraints (OPT/TOC), Flexible Manufacturing Systems (FMS), Total Quality Management (TQM), Lean Manufacturing, Agility, Time-Based Competition (TBC), Quick Response Manufacturing (QR/QRM) and Business Process Re-Engineering (BPR) [3]. The later alternative that has been implemented by the aerospace manufacturing company under study is the implementation of Lean Manufacturing, which means waste elimination.

The purpose of this study is to assess the level of achievement of Lean Manufacturing Implementation status before and after the development of Key Performance Indicators (KPIs) at an aerospace manufacturing company or in other words the links between the KPIs that has been developed to the lean implementations efforts.

## Lean Manufacturing

Lean manufacturing has been introduced by Womack [4] which describes the TPS (Toyota Production System) developed by Eiji Toyoda and Taiichi Ohno at Toyota Motor Company in Japan. Taiichi Ohno, one of co-developers of the Toyota Production System; according to Kilpatrick [5], have suggested that "waste accounts for nearly 95% of all costs" and that is why Lean Manufacturing is practised to reduce the non-value added activities produced by an organization or factory [6]. In other words, it can be said that the philosophy of Lean Manufacturing can be illustrated by using Toyota Production System as an example [7].

The term 'lean' is used due to the majority of all activities are doing less compared to mass production techniques such as deducting half of the labour hours, factory space and tooling investment [7]. New products can also be developed by using less engineering hours. This principle is not only successfully applied in automotive industry but also in other sectors, including aerospace industry (across Europe and North America) [8].

The aerospace manufacturing company under study have established a Lean Promotion Office (LPO) to promote Lean Manufacturing culture as company wide activities and to monitor all lean activities in production floor and report the progress to top management to drive cost reduction. In addition, LPO which is under Strategic Development Department (SDD) is responsible to organize internal lean manufacturing training and workshop in terms of principles, basic approach, tools and techniques, 7 wastes based on quality, cost, delivery, accountability and continuous improvement QCDAC targets.

## Key Performance Indicators (KPIs)

KPI's is one of the tools for evaluating the performance measurements. One of the reasons for the success of company in implementing lean manufacturing is the performance measurement culture that already exists and established in it [8].
Smith [10] defined KPIs as measures of success or compliance. It is one of the tools in performance measurement systems that currently had been chosen by many industry analysts, organisations and enterprises. Measuring the performance of any operation needs KPI intervention especially in an industry which performance metrics exist.

KPIs allow a company to see what areas it is executing well and what areas require improvement. Whatever KPIs selected, they must reflect the organisations goals, they must be key to success, and they must be quantifiable (measurable)
Lastly, with good KPIs as one of the performance measurement system tool, companies or organisations can be self-assured with their manufacturing tools and techniques implementation for achieving their goals or objectives. Hence, good KPIs must be clear, able to be gauged or measured with specific aim. Refer to Appendix (Figure 1.0) to see to new Company KPIs framework that had been developed.

## Findings and Discussions

**The level of achievement of lean implementation status before and after the development of KPIs**

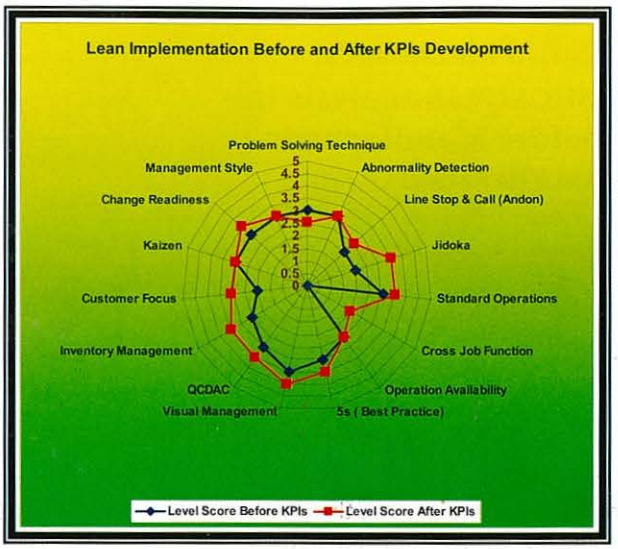



*Figure 2-0: Lean implementation status before and after the development of Key Performance Indicators (KPIs) .(Level 1 – Traditional way; Level 2 – Starting Change; Level 3 – Standardized; Level 4 - Supply Chain Integrations; Level 5 – Lean Sustainability)*

Level of achievement of lean implementation before and after the development of KPIs can be seen at Table 1-0 and Figure 2-0. To evaluate the level of achievement, RAG status measurement had been applied with reference to the audit criteria's in each of the tools and technique.

As a summary, based on results through Table 1-0 and Figure 2 -0 it showed that ten out of fifteen tools and techniques had improve their level of score after the implementation of KPIs.

However, there are some tools and techniques that still could not score the targeted level of lean implementations. For example, the abnormality detection and operation availability tools and technique only managed to score the same level of achievement (amber status) even though after the implementation of KPIs. The main reason was because they had just started the systematic approach through Total Productive Maintenance (Fuguai) programme. Two others tools and technique that were also in amber status are Line Stop & Call (Andon) and cross job function.

The only tool and techniques that failed to improved (red status) was problem solving technique. Through the investigations, it was found that they are too many methods used by the user (employees) and this created confusion among them. The countermeasures that had been taken are to find the objective of every methods/tools that had been applied by six sigma coordinator.

However, overall it can be said that the level of lean implementation has improved after the implementation of the new KPIs.

### Overview of the Research findings

Listed below is a summary of the important findings that address the questions of the study:-

The level of achievement of lean implementation before and after the development of KPIs has been analysed .To evaluate the level of achievement, RAG (Red Amber Green) status measurement had been applied with reference to the au[illegible] criteria in each of the tools and technique

As a summary, results
techniques had improve
mentation of KPIs. C
lean implementa[illegible]

### Conclusion

As a conclusion, from this study, the links betweer and KPIs have been found. Results showed that ten out ifteen lean tools and techniques had improved their level of score after the implementation of KPIs. By and large, it can be deduced that the level of lean implementation has improved with the new KPIs.


### Acknowledgement

The researchers would like acknowledge the Faculty of Manufacturing Engineering (FKP) of Unversiti Teknikal Malaysia Melaka (UTeM) for providing the facilities in carrying out this study.

The researchers also wish to thank the people who given their support and help in finishing this study, without their help, this paper will never be written.


### References


[1]Willis, T.H. and Huston C.R., (1990) *"Vendor Requirements and Evaluation in a JIT Environment,* International Journal of Operations & Production Management, 10:4, Page 41-50.

[2]Doolen T., Traxler M. M. and Mcbride K. (2006), *Using Scorecards for supplier Performance Improvement: Case application in a Lean Manufacturing Organisation,* Engineering Management Journal, Vol.18, No2.Page 26-34.

[3] MacCarthy B.L. and Wilson J.R., (2001), *Human Performance in Planning and Scheduling*, Taylor and Francis.

[4] Womack J. P., Ross and Jones D. T., (1990), *"The machine that changed the World"*, Simon & Schuster.

[5] Kilpatrick J., (2003), *"Lean Principles,"* Available online on <http://www.MEP.ORG.> [8 December 2006].

[6] Comm C. L., and Mathaisel D. F. X., (2005), *An Exploratory Analysis in Applying Lean Manufacturing to a Labour-Intensive Industry in China*, Asia Pacific Journal of Marketing and Logistics, Volume 17 No 4.

[7] Burcher P., Simon D. and Geoffrey R. , (1996), *The road to lean repetitive batch manufacturing Modelling planning system performance*, International Journal of Operations& Production Management, Vol. 16 No. 2 ,Page 210-220.

[8] Haque B. and Moore M.J. , (2004), *Measures of performance of Lean product introduction in the aerospace industry,* Institution of Mechanical Engineers, Vol 218, Part B, Page 1387-1398.

[9] Theodore H. P., (2003), *Measuring Performance in Public and None profit Organisations,* San Francisco: Jossey-Bass.

[10] Smith, F. O., (2007), *Article in Column Information Control: KPIs Made Easy,* Control Engineering (January 2007), Page 42-46.

# The Role of Experimental Solid Mechanics: Photo elasticity and Photo elastic stress analysis in Practical Engineering Design before Manufacturing

Ir Dr Thoguluva Raghavan Vijayaram

## Emphasis of experimental solid mechanics

The analytical and numerical (computer simulation with finite elemental modelling) determination of stresses in the field of practical engineering design often becomes so complicated. An accurate knowledge of the stresses can only be obtained by experimental methods (by means of experimental stress analysis).

## Techniques applied in experimental stress analysis

- Strain gage method
- Photo elasticity method
- Interferometry
- Atomic Force Microscopy
- Holography
- Thermo elastic stress analysis
- Photo acoustics technique
- X-Ray stress analysis
- Digital Shearography
- Laser Doppler Vibrometry

## Theory of Photo elasticity

If a transparent elastic object such as glass is viewed in polarized light, colours appear in it, when the object is stressed. This experimental fact has been worked out into a full-fledged accurate technique for measuring complicated stress distributions. Photo elasticity is a whole-field stress analysis technique based on an optical-mechanical property called birefringence. A loaded photo elastic specimen, combined with other optical elements, and illuminated with an ordinary light source exhibits fringe patterns that are related to the difference between the principal stresses in a plane normal to the light propagation direction. The physical theory involved in the photo elastic stress analysis includes the double refraction of polarized light passing through translucent material which is under stress. Light is plane polarized by altering the waves emitted from a source so that waves are produced which vibrate only in one direction normal to the direction of wave propagation. A polariscope is needed for viewing the fringes induced by the stresses [shown in Figure-1(a) and Figure-1(b)].

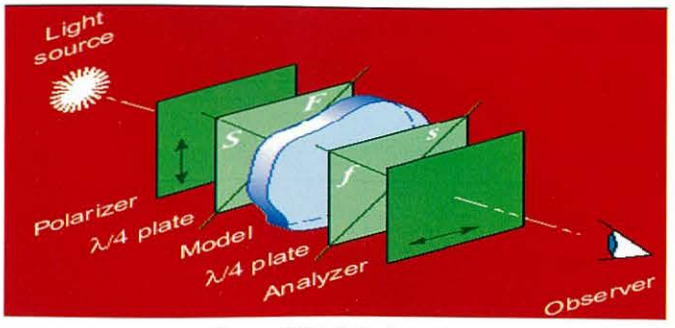



*Figure-1(a) Polariscope*

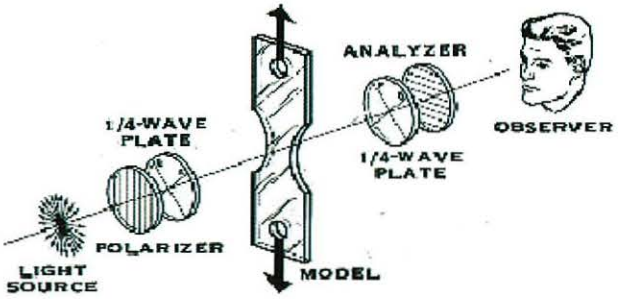



*Figure-1(b) Polariscope*

Experiments have demonstrated that if this unidirectional beam is passed through a transparent crystal, such as quartz or tourmaline, the beam will be divided into two mutually perpendicular components (with different velocities and out of phase), a phenomenon termed as double refraction, under the action of stresses. If these two beams are now brought back into the same plane of vibration, an interference pattern will be formed due to the difference of phase. If the image is projected upon a screen, a pattern of colour bands will be produced. The most convenient means of obtaining plane polarized light is through the use of polarized discs. The sensitivity of a photo elastic material is characterized by its *fringe constant fσ*. This constant relates the value "*N*" associated with a given fringe to the thickness *h* of the specimen in the light-propagation direction and the difference between the principal stresses in the plane normal to the light-propagation direction as follows:

$$\sigma_1 - \sigma_2 = \frac{Nf_\sigma}{h}$$

Two types of pattern can be obtained. They are called as isochromatics and isoclinics. The former is related to the principal stress differences and the latter to the principal stress directions. Photographs of the stress distribution pattern is shown in Figure-2, 3, 4, 5, and 6.

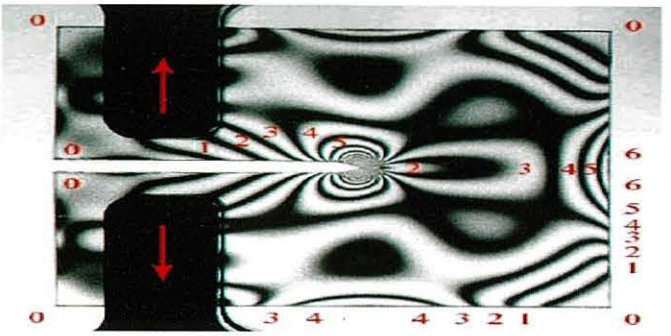
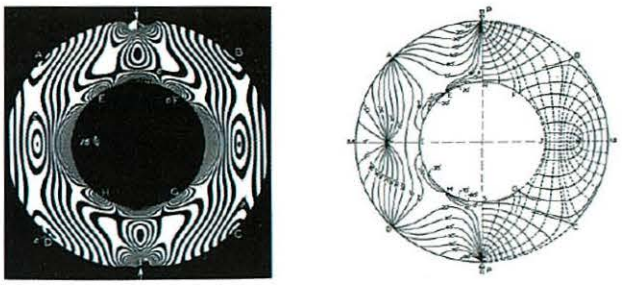


*Figure-2 Photograph of stress distribution pattern (photo elastic pattern: contour maps)*



a) Isochromatics b) Isoclinics and Stress Trajectories

*Figure-3 (a) Isochromatics and (b) Isoclinics*

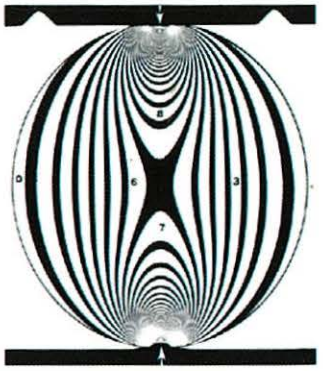


*Figure-4 Isochromatics: Horizontal stress on the vertical diameter of a diametrically loaded disk and discuss the split-cylinder test for the tensile strength of cast iron*

*Figure-5 Isochromatics: A thin disk subjected to four equal radial loads acting on two mutually perpendicular diameters*

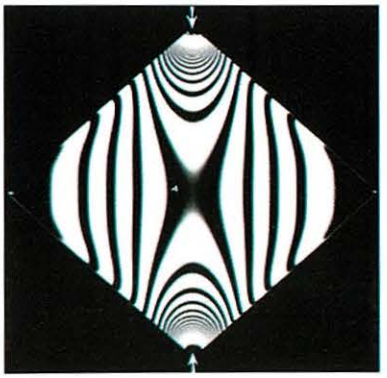
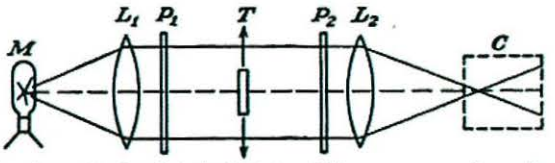


*Figure-6 Isochromatics: Fringe pattern near the load points: A square loaded across a diagonal*

**Photo elastic stress analysis: Experimental set-up**

An experimental arrangement to perform photo elastic stress analysis is shown in Figure-7.




Apparatus for photoelastic tests. *M* is a mercury-arc lamp; $L_1$ and $L_2$ are condensing lenses, $P_1$ and $P_2$ are disks of polaroid, *T* is the bakelite test piece, and *C* is a camera.

**Figure-7 Photo elasticity experimental set-up**

The photo elastic test set up consists of a source of monochromatic light; single colored light, usually a bluish green mercury arc lamp, two ordinary glass lenses, two plates of polaroid, a camera, and the test piece. The first lens, $L_1$ serves to convert the diverging beam of light from the lamp, M into a parallel beam, which passes through the test piece, T and the second lens, $L_2$ changes that parallel beam into a converging one to the objective of the camera, C. The two circular disks of polaroid, $P_1$ and $P_2$ of 10 in. diameter and about 1/16 in. thickness, look like an ordinary glass, slightly tinted, have the important property of polarizing the light. The test piece,T between the polaroid plates is made of special yellowish, transparent bakelite, usually about ¼ or ½ in. thick, cut out from a flat plate to the desired contour and placed with its flat side perpendicular to the rays of light so that the light traverses the ¼ in. thickness. It is mounted in a loading frame by means of which accurately measurable loads can be imposed on it. The camera is used to photograph the picture, but for preliminary visual observation it and the second lens can be omitted and replaced by a milk glass-screen. Now we can place between the polaroid plates a specimen of a shape and with loading so complicated that we are unable to calculate the stress in advance. Then, by counting the number of black lines passing a point of our specimen while loading it, we determine the stress experimentally. Consider Figure-8 shown below, the central portion of a beam, in which two semicircular notches have been cut with a diameter equal to one-quarter of the height of the beam.

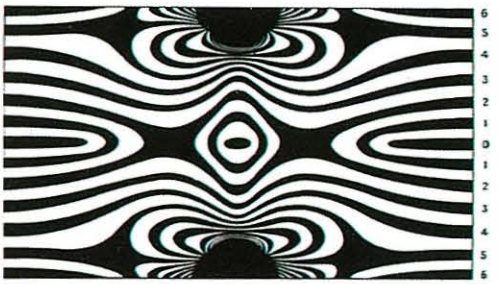



*Figure-8 Photo elastic pattern: The extreme fibres of the beam away from the notches have 6 units of stress; in the bottom of the notch the stress is greater than 11 units*

At the left and right end of the above picture, at some distance from the notches, the pattern has parallel lines. Counting from the central black line, the zero line, toward the upper or lower edge, we cross six lines, so that the bending stress at the edges of the beam has 6 units. When we count from the centre to the bottom of the notch, we cross at least 14 lines, the last ones being so close together that they become indistinct. Thus we see that the stress at the bottom of the notch is more than 14 units, or about 2 ½ times the stress at the edge away from the notch.

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Consider Figure-9 shown below, the central portion of a beam, in which the notch in a bent bar is somewhat deeper and of narrow rectangular shape with sharp square edges at the bottom.

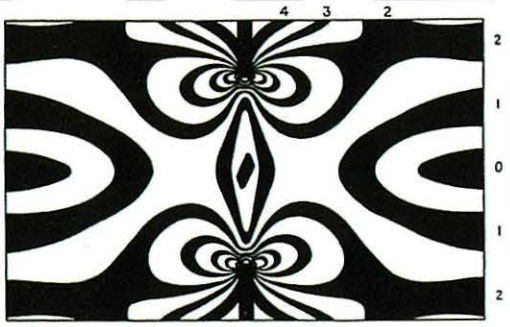



*Figure-9 Photo elastic pattern: The stress at the bottom of these notches is so great that the beam itself could not be loaded to 6 units*

The stress concentration is so great that, if the beam had been bent to 6 units, and the stress at the bottom of the notch would have been in excess of the 20 units allowable below the yield point of the bakelite. Therefore, this test was made by increasing the bending load up from zero, and counting the lines as they formed at the bottom corners of the notch until fourteen such lines had appeared. Away from the notch, calling the central black- line number zero, we count till 2 at the outer edge. Starting from the center of the picture to the bottom corner of the notch, we count to 6 units distinctly.

## CARBON-COATED NANOMAGNETS COULD BE A NEW FORM OF CANCER TREATMENT

*Mohd Shukor bin Salleh*

Carbon-coated nanomagnets may offer a new form of cancer treatment. Research presented at the *103rd Annual Scientific Meeting of the American Urological Association* (AUA) suggests that nanoparticles consisting of metallic iron with a protective carbon coat could serve as a safe and effective hyperthermia agent. Researchers from Germany have found that in animal models, using heat to selectively kill tumor cells is efficient. Using metallic iron in the nanoparticles (in lieu of iron oxide) would allow heating at greater temperatures; and coating the iron with carbon would prevent the iron from rusting, which can hinder the effectiveness of the therapy. In order to ensure that the nanoparticles did not harm non-cancerous cells, researchers tested their compatibility with normal tissues. Human PC-3 prostate cells and a non-malignant fibroblast cell line were incubated with the carbon coated nanomagnets and after the incubation period, the cells did not experience major cytotoxic (cell-destroying) effects. The cell cycle distribution and the apoptosis rate were not impaired by the presence of nanomagnets, reflecting the biocompatible character of these structures. This breakthrough could provide an effective treatment option for many types of cancer, without the destruction of surrounding cells associated with chemotherapy or invasive surgery. The fact that the carbon-coating prevented cell destruction during incubation proves that the nanoparticles could potentially serve as safe and effective hyperthermia agents, targeting and destroying cancerous cells. These findings underscore a need for more research regarding the use of nanoparticles as potential cancer treatments.

# RESEARCH GRANT

Throughout 2009, the FKP staffs have been awarded 15 short term grants with a total amount of RM 342,000. The following table shows the list of research grants awarded to FKP staffs.

## SENARAI PENYELIDIKAN JANGKA PENDEK SESI 2009 YANG DILULUSKAN

| BIL | NO. PROJEK | NAMA PENYELIDIK | TAJUK PENYELIDIKAN | TOTAL (RM) |
|---|---|---|---|---|
| 1 | PJP/2009/FKP (1A) S529 | Jeeferie Bin Abd Razak | Development and Mechanical Testing of Wood Plastic Composite (WPC) Made of Recycled Polymer and Recycled Wood Flour | 25,000.00 |
| 2 | PJP/2009/FKP (2A) S530 | Mohd Fairuz bin Dimin | Study of The Influence of Coupling Agent and Additives on The Mechanical Properties of Wood Plastic Composite | 25,000.00 |
| 3 | PJP/2009/FKP (3A) S531 | Ammar Bin Abd Rahman | Investigation of The Effect of Shot Peening on The Fatigue Strength of Alluminum Alloy | 10,000.00 |
| 4 | PJP/2009/FKP (4A) S532 | Wahyono Sapto Widodo | Design of New Punch Geometry to Reduce Force in Sheet Metal Piercing Process | 10,000.00 |
| 5 | PJP/2009/FKP (5A) S533 | Taufik | Design and Analysis of Production Tooling for Metal Matrix Composite by Investment Casting | 10,000.00 |
| 6 | PJP/2009/FKP (6A) S534 | Mohamad Kamil Bin Sued | The Dimensional Information Extration From Cloud of points | 10,000.00 |
| 7 | PJP/2009/FKP (7C) S535 | Dr. Zamberi bin Jamaludin | Rebust Motion Controller Design and Accurate Positioning System for A Sliding Table | 20,000.00 |
| 8 | PJP/2009/FKP (8A) S536 | Sivarao a/l Subramonian | Engineering of Mechanical Control Kit For Unmanned Grass Cutter | 31,500.00 |
| 9 | PJP/2009/FKP(16F)S584 | Effendi Mohamad | The Implemetation of Risk Management In An Aerospace Manufacturing Company | 10,500.00 |
| 10 | PJP/2009/FKP(17A) S607 | PM Chong Kuan Eng | Heuristics For Capacity Planning in High-Product Mix Tooling and Parts Factory | 40,000.00 |
| 11 | PJP/2009/FKP(18A) S608 | PM Dr. T. Joseph Sahaya Anand | Synthesisi and Characterization of Transition Metal Chalcogenide Thin Films For Solar / PEC Cell Application | 40,000.00 |
| 12 | PJP/2009/FKP(19F)S609 | PM Dr. Mohamed Khaled | A Simulation Approach to Evaluate Qualtiy / Cost Management Decisions | 40,000.00 |
| 13 | PJP/2009/FKP(20F)S610 | PM Dr. Mohamed Khaled | An Intergrated Approach to The Supplier Selection Problem | 30,000.00 |
| 14 | PJP/2009/FKP(21A) S611 | Dr. Mohd Warikh | Producing Calcium Cuprum Manganese Oxide (CaCu3Mn4O12) via Wet Chemistry and Solid State Techniques | 40,000.00 |
| 15 | PJP/2009/FKP(22A) S612 | Ir. Sivarao Subramonian | Design and Development of A Device to Automatically Control Tyre Inflation Process | 30,000.00 |

## SENARAI PENYERTAAN PENYELIDIKAN & PINGAT YANG DIPEROLEHI

| BIL | NAMA PAMERAN | TEMPAT | ANUGERAH | NAMA PENYELIDIK |
|---|---|---|---|---|
| 1 | Japan Intellectual Property Association (JIPA) Special Award | - | Special Award for Best Biotechnology Innovation for PCRDisc | Dr. D. Sugumar, Prof. Asma Ismail, A.P. Dr. Lingxue Kong |
| 2 | iENA | - | Special Award for Best Design in Biotechnology for PCRDisc | Dr. D. Sugumar, Prof. Asma Ismail, A.P. Dr. Lingxue Kong |
| 3 | - | Australia | Smart Geelong Early Researcher Award | Dr. D. Sugumar |
| 4 | ITEX 2009 | - | Gold Medal for PCRDisc | Dr. D. Sugumar, Prof. Asma Ismail, A.P. Dr. Lingxue Kong |
| 5 | Malaysian Technology Expo (MTE 2009) | Putra World Trade Centre, KL | Bronze medal for Automatic Wudhu' Machine based on Vision | Adnan Rachmat A.B., Ruzaidi Z., Ahmad Yusairi B.h., Md Dan M.P., Anton Satria P., Habibullah A., Zulkifli T. |
| 6 | Malaysia Technology Expo (MTE 2009) | Putra World Trade Centre, KL | Bronze medal for Automatic Ablution Machine using Vision Sensor with Skin Detection Method | Ruzaidi Zamri |

## SENARAI PENYERTAAN JURNAL 2009

| BIL | NAMA PENULIS | TAJUK JURNAL | NAMA JURNAL |
|---|---|---|---|
| 1 | Mohamed K. Omar, Suresh Kumar and Yasothei S | Performance Analysis in Re-entrant operation with Combinational Routing and Yield Probabilities | Applied Mathematical Modeling, Vol. 33, No. 3, pp. 1601-1612, (2009) |
| 2 | Mohamed K. Omar and J. A. Bennell | Revising the Master Production Schedule in a HPP framework | International Journal of Production Research ,vol. 47, No 20, pp-5857-5879-(2009) |
| 3 | HK. Sim, Mohamed K. Omar, Y. J. Jackie Kong and S. C. Bong | A Survey on Cost of Quality in Malaysian Automotive and Supportive Industry | International Journal of Manufacturing Technology and Management, Vol. 17 No 4, pp-437-452 (2009) |
| 4 | Lok, Y.Y., Pop, I. Ingham, D.B. and Amin, N | Mixed Convection Flow of a Micropolar Fluid Near a Non-Orthogonal Stagnation-Point on a Stretching Vertical Sheet | International Journal of Numerical Methods for Heat and Fluid Flow, vol.39, p459-483, 2009 |
| 5 | Lok, Y.Y., Amin, N. and Pop, I | Unsteady Boundary Layer Flow Induced by Accelerating Motion near the Rear Stagnation Point in a Micropolar Fluid | International Journal of Fluid Mechanics Research, vol.36, pp. 30-42 |
| 6 | Sugumar, D. & Tio, Kek Kiong | The effects of working fluid on the heat transport capacity of a micro heat pipe. | Journal of Heat Transfer, 131(1), pp. 10-17 |
| 7 | Puvanasvaran, A.P, M.H.M.A. Megat, Tang S.H, M.R, Rosnah, Muhamad, M.R, A.M.S. Hamouda | Leanness Achievement through People Development System in Implementing Lean Process Management | American Journal of Engineering and Applied Sciences, Vol.2 No. 1, 2009, ISSN 1941 7020 © 2009 Science Publications, pp.105-119 |
| 8 | A.P. Puvanasvaran, M.H.M.A. Megat, Tang S.H, Muhamad, M.R, A.M.S. Hamouda | The Roles of Communication Process for an Effective Lean Manufacturing Implementation | Journal of Industrial Engineering and Management, Vol 2 No.1, pp. 128-152 - ISSN: 2013-0953 |
| 9 | A.P. Puvanasvaran, M.H.M.A. Megat, Tang S.H, Muhamad, M.R, A.M.S. Hamouda | Lean Behavior in Implementing Lean Process Management | Journal of Applied Scienes Research, Vol. 5 No.8 pp. 930-943, 2009© 2009, INSInet Publication |

# SENARAI PERSIDANGAN & PEMBENTANGAN KERTAS KERJA 2009

| BIL | NAMA STAF | PERSIDANGAN | TARIKH | TAJUK KERTAS KERJA | TEMPAT |
|---|---|---|---|---|---|
| 1 | Ahmad Yusairi Bin Bani Hashim | International Conference on Signal Acquisition and Processing (ICSAP 2009) | 3 - 4 April 2009 | Authentication Model Using Multiple Sensors Input | Kuala Lumpur |
| 2 | Ahmad Yusairi Bin Bani Hashim | International Conference on Advances in Mechanical Engineering (ICAME 2009) | 24 - 26 Jun 2009 | Review on Prosthetic & Lead Screw Apparatus for Manufacturing Engineering Control Laboratory | Shah Alam, Selangor |
| 3 | Ahmad Yusairi Bin Bani Hashim | 2nd ICOWOBAS & RAFSS 2009 | 2 - 4 Jun 2009 | Formalizing array of foot's bones through a graph | Johor Bahru |
| 4 | Nur Aidawaty Bte Rafan | International Conference on Advances in Mechanical Engineering (ICAME 2009) | 24 - 26 Jun 2009 | Automated Guided Cart & An Improvement on Positioning Technique on Current XY Table | Shah Alam, Selangor |
| 5 | Nurazua Bte Mohd Yusop | International Conference on Advances in Mechanical Engineering (ICAME 2009) | 24 - 26 Jun 2009 | Parameter Optimization of Dress Machine For Disposable Pet Bottle | Shah Alam, Selangor |
| 6 | Lokman Bin Abdullah | International Conference on Advances in Mechanical Engineering (ICAME 2009) | 24 - 26 Jun 2009 | Simulation of An Automated Tool Charger using Automation Studio for Industrial Application | Shah Alam, Selangor |
| 7 | Dr. Thogoluva | International Conference on Advanced Manufacturing and Automation 2009 (INCAMA 2009) | 26 - 28 Mac 2009 | Powder Metallurgical Processing of Graphite Particulate Aluminium MMC | Kalasalingam University Anand Nagar Krishnankoil, India |
| 8 | Ismail Bin Abu Shah | International Conference on Advances in Mechanical Engineering (ICAME 2009) | 24 - 25 Jun 2009 | Re-Design of Nail Clipper Through BD DFA & Design and Development of An Automated Satay Assembly Machine | Shah Alam, Selangor |
| 9 | Wan Hasrulnizzam Bin Wan Mahmood | International Conference on Innovation, Management and Technology | 27 - 29 Mei 2009 | Supply Chain Management : After BPR | Holiday Inn, Tabu Narita, Japan |
| 10 | Mohamad Kamil Bin Sued | International Conference on Advances in Mechanical Engineering (ICAME 2009) | 24 - 26 Jun 2009 | Dimensional Inspection of Small and Mesoscale Components Using Lase Scanner | Shah Alam, Selangor |
| 11 | Taufik | 4th International Conference on Recent Advances in Material, Minerals, and Enviroment | 1 - 3 Jun 2009 | Simulation on Cast Metal Matrix Composite by Investment Casting | Bayview Beach Resort, Pulau Pinang |
| 12 | Saifudin Hafiz | 5th Asian Mathematical Conference 2009 (AMC 2009) | 22 - 26 Jun 2009 | Spur Gear Design Using An S-Shaped Transition Curve With Finite Element Analysis | Putra World Trade Centre, Kuala Lumpur |
| 13 | Syamimi | Malaysian Technical Universities Conference on Engineering and Technology (MUCET) | 20 - 22 Jun 2009 | Accuracy & Repeatability Analysis of Industrial Robots under Loaded Conditions and Various Distances | Universiti Malaysia Pahang |
| 14 | Dr. Jariah | International Nuclear Conference 2009 | 29 Jun - 1 Julai 2009 | Glass Composite for Nuclear Waste Immobilization | PWTC, Kuala Lumpur |

# KURSUS & BENGKEL YANG DIHADIRI STAF FKP

| BIL | KURSUS | NAMA | TARIKH &TEMPAT |
|---|---|---|---|
| 1 | "Bullet Proof Patents & Patent Strategy" | Mohd Yuhazri Bin Yaakob | 2 Sehingga 3 Mac 2009 Di Hotel Equatorial Bangi, Selangor |
| 2 | International Conference On Signal Acquisition And Processing (ICSAP 2009) | Ahmad Yusairi Bin Bani Hashim | 3 Sehingga 4 April 2009 Di Kuala Lumpur |
| 3 | International Conference On Advances In Mechanical Engineering (ICAME 2009) | Ahmad Yusairi Bin Bani Hashim & Lokman Bin Abdullah | 24 Sehingga 25Jun 2009 Di Shah Alam, Selangor |
| 4 | 2nd ICOWOBAS & RAFSS 2009 | Ahmad Yusairi Bin Bani Hashim | 2 Sehingga 4 Jun 2009 Di Johor Bahru |
| 5 | International Conference On Engineering And Education In The 21st Century | Rohana Bte Abdullah | 23 Sehingga 25 Mac 2009 Di Crowne Plaza Riverside, Kuching, Sarawak |
| 6 | 1st Regional Conference On Materials 2009 | Chang Siang Yee | 16 Hingga 17 Februari 2009 Di Equatorial Hotel,Pulau Pinang |
| 7 | A Seminar On Innovative Solutions For Polymer + Rubber Processing And Characterization | Jeefferie Bin Abd Razak & Hairulhisham Bin Rosnan | 18 Februari 2009, Holiday Villa, Subang |
| 8 | Kursus Pengurusan Aset | Azman Bin Mat Aris & Nik Mohd Farid | 25-27 Feb 2009, Puteri Resort, Ayer Keroh, Melaka |
| 9 | Kursus Desktop Productivity (Words 2007 Advanced) | Marhamah,Zuraida, Mohd Hanafiah, Ahmad Faizul | 11 & 12 Mac 2009 Dewan Siber Utem |
| 10 | Kursus Kesedaran Asas Keselamatan & Kesihatan Pekerjaan | Jazlan, Mohd Hanafiah | 11 & 12 Mac 2009 Bilik Mesyuarat 2, Tingkat 1, MITC |
| 11 | Seminar Pentadbiran Dan Kesetiausahaan Profesional (POTENSI 2009) | Nur Hidayah Bte Mustafah | 20 & 22 April 2009 Kuala Terengganu |
| 12 | Managing International Students: Issues And Challenges | Nur Azriah Bte Amir | 2 Hingga 4 April 2009 Awana Genting Highlands Golf And Country Resort |
| 13 | The Uncertainity Of Measurements | Mohammad Kamil Bin Sued | 23 Mac 2009 Sendi Mahir Sdn Bhd |
| 14 | Bengkel Asas Adobe Photoshop | Razifah Bte Mat Rais, Mazlan Bin Mehat | 6 Sehingga 7 April 2009 Di UTM Skudai, Johor |
| 15 | Kursus Pertolongan Cemas & CPR | Mazlan Bin Mehat | 17-18 Mac 2009 Di Hotel Ancasa MITC |
| 16 | National EDU Tour Teaching Teaching And Research With MATLAB And Simulink | Lok Yian Yian | 22 April 2009 Di Universiti Malaya |
| 17 | Teaching And Research With MATLAB And Simulink | Mohamad Kamil Bin Sued, Saifudin Hafiz Bin Yahaya | 28 April 2009 Di Universiti Teknologi Mara, Pulau Pinang |
| 18 | Seminar On Developing A Quality Research Portfolio | Dr. Zamberi Bin Jamaludin | 15 Hingga 16 April 2009 Di Hotel Grand Season, Kuala Lumpur |
| 19 | Persidangan Kebangsaan Penerbitan Ilmiah 2009 | Dr. Zamberi Bin Jamaludin | 18 Hingga 19 April 2009 Di Hotel Seri Pacific, Kuala Lumpur |
| 20 | Seminar "ESQ Leadership Training" Angkatan 3 | Jeefferie Bin Abd Razak | Ballroom MITC Konvensyen Centre, Ayer Keroh |
| 21 | VB.Net | Ahmad Yusairi | 4 Hingga 6 Mei 2009 Di FTMK |
| 22 | Kursus Kewangan Untuk Staf Sokongan | Puan Nur Ain Zakirah Bte Bahari,Encik Jaafar Bin Lajis,Encik Sahar Bin Salehan, Encik Mohd Hisyam Bin Ibrahim | 1-2 Jun 2009 |
| 23 | Kursus Fail Dan Rekod | Ernihazra Bin Md Johan,Nur Hidayah Bte Mustafah | 27 Mei 2009 |
| 24 | Programable Logic Controller (Plc) Advanced With Scada Intergration | Silah Hayati Bte Kamsani,Mohamad Zin Bin Mahmud,Hanafiah Bin Mohd Isa | 18 Hingga 21 Mei 2009 |

# KURSUS & BENGKEL YANG DIHADIRI STAF FKP

| BIL | KURSUS | NAMA | TARIKH &TEMPAT |
|---|---|---|---|
| 25 | Bengkel Penyediaan Soalan Dan Pembinaan Item Ujian | Ammar Bin Abd. Rahman, Nurul Hidayah Bte Arshad,Mahasan Bin Mat Ali,Chang Siang Yee,Hanizam Bin Hashim | 19 Mei 2009 |
| 26 | Bengkel Penulisan Modul | Nur Aidawaty Bt Rafan,Nurazua Binti Mohd Yusop | 19 Mei 2009 |
| 27 | Penyelenggaraan & Konfigurasi Komputer | Aini Bte Abd. Ghaffar,Marhamah Bte Ahmad | 20 Mei 2009 |
| 28 | Microsoft Excel Advanced | Aini Bte Abd. Ghaffar,Nur Ain Zakirah Bte Bahari | 20-21 Mei 2009 Dewan Siber, Pusat Komputer |
| 29 | Kursus Perkhidmatan Dan Penjawatan | Razifah Bte Mat Rais, Marhamah Bte Ahmad | 27-28 Mei 2009 MITC Konvensyen Center |
| 30 | Matlab & Simulink Day 2009 ; Shape Up For Future R&D Challenges | Lok Yian Yian | 17-18 Jun 2009 Sheraton Subang Hotel & Towers |
| 31 | Engineering Management Practice | Rohana Bte Abdullah | 18-19 Jun 2009 Sibu, Sarawak |
| 32 | Kursus Local Area Network (LAN) | Muhamad Syafik, Mohamad Ridzuan, Mohd Hisham, Ahmad Faizul | 5-6 Mei 2009 Dewan Siber Pusat Komputer |
| 33 | Kursus Elaun-Elaun Dalam Perkhidmatan | Nur Ain Zakirah, Noridayu | 29-30 April 2009 Bilik Mesyuarat 2, |
| 34 | Bengkel Kenali Diri Melalui Ujian Personaliti Bagi Staf Pentadbiran | Muhamad Jafri | 29 April 2009 Auditorium Canselori, Kampus Induk |
| 35 | Bengkel Rekabentuk Dan Rekaletak Grafik 2009 | Mohd Yuhazri, Mohd Raduan, Razifah | 27-28 April 2009 Makmal E-Learning PPP, Kampus Bandar |

seminar & workshop highlights

## VISIT AND SEMINAR FROM PROF. DR ELSAYED A. ORADY

*Masni-Azian Akiah*

From the 2nd to 13th March 2009, Manufacturing Engineering Faculty received external examiner visit by Prof. Dr Elsayed A. Orady. Prof. Dr. Elsayed is a professor from Department of Industrial and Manufacturing System Engineering, University of Michigan-Dearbon. His activities throughout the visit includes document evaluation and curriculum and syllabus review for all department within the faculty. In addition, Prof. Dr. Elsayed also conducted two session of seminar, namely "Implementation of Statistical Techniques in Teaching Manufacturing Process Laboratories", which is attended by all academic staff, students and graduate students, and another seminar namely "Advances in Rapid Prototyping Technology" which is attended by all academic staff and student from Design Department.

Prof. Dr. Elsayed is an expert in the field of manufacturing processes, machine tools and tool design, CAD/CAM/CAPP and CIM, Metrology with emphasis on CMM, Intelligent diagnostic systems for manufacturing processes, robot metrology and robot work-cell design, virtual manufacturing and simulation, finite elements applications to manufacturing processes, design for manufacture, simultaneous engineering and also rapid prototyping and rapid tooling. With his vast knowledge and experience in the field stated above, Prof. Dr. Elsayed's visit can definitely provide an utmost benefit to our faculty to excel further in Manufacturing field.

## BENGKEL OUTCOME BASED LEARNING

*Mohammad Kamil Sued*

Sebelum bermulanya semester I 2008/2009, Fakulti Kejuruteraan Pembuatan (FKP) telah mengadakan satu bengkel 'Outcome Based Learning' (OBE), yang bertujuan untuk menyelaraskan perlaksanaan OBE di peringkat fakulti. Selain itu, pensyarah dan tenaga pengajar yang baru juga dapat di dedahkan kepada OBE di dalam pengajaran dan pembelajaran. Bengkel ini telah berlangsung pada 16hb Jun 2009 bertempat di Bilik Kuliah 5 dan 6, Kampus Industri, Ayer Keroh. Bengkel bermula pada jam 8:00 pagi dan Timbalan Dekan Akademik, En. Nor Akramin bin Mohamad telah mempengerusikan bengkel tersebut . Bengkel dimulakan dengan ucapan aluan daripada dekan FKP, Dr. Mohd Rizal bin Salleh. En. Abdul Rahim bin Shamsudin dan En. Shariman b. Abdullah telah menyampaikan ceramah informasi dan bimbingan berkenaan OBE yang bertajuk 'Kepentingan OBE dalam Proses Akreditasi Program Kejuruteraan' dan 'Perlaksanaan OBE di FKP'. Selepas ceramah tersebut, semua staf akademik telah bekerjasama untuk menghasilkan Perancangan Mengajar dan di bentangkan di peringkat Jabatan. Bengkel ini berakhir pada jam 5:00 petang.

# PAMERAN PROJEK REKABENTUK PELAJAR DIPLOMA KEJURUTERAAN PEMBUATAN

*Masni-Azian Akiah*

Pameran projek rekabentuk telah dijalankan pada 8 April 2009 yang lepas, bertempat di Makmal Fasa B (Makmal Bahan, Makmal CNC dan Makmal Kuasa Bendalir) Fakulti Kejuruteraan Pembuatan di mana setiap kumpulan pelajar telah diperuntukkan ruang pameran masing-masing bagi persembahan poster teknikal dan produk bagi projek reka bentuk mereka.

Projek Reka Bentuk merupakan mata pelajaran pembuatan projek yang dijalankan bagi memenuhi sebahagian daripada syarat yang telah diwajibkan ke atas pelajar tahun akhir kursus Diploma Kejuruteraan Pembuatan.

Diantara objektif pengendalian matapelajaran ini ialah:

(i) Melatih dan meningkatkan kreativiti pelajar dalam menghasilkan suatu reka bentuk di samping menambahkan pengetahuan pelajar dalam sesuatu bidang kejuruteraan.

(ii) Melatih pelajar membentang dan mempertahankan hasil reka bentuknya di dalam seminar, melaporkan dalam bentuk laporan dengan cemerlang dan berkesan serta membuat pameran hasil produk.

(iii) Melatih dan melahirkan pelajar agar berkemampuan mengendalikan kerja-kerja dengan penyeliaan yang minimum dan lebih berdikari dalam mencari, mendalami dan mengembangkan ilmu pengetahuan serta pengalaman.

(iv) Memupuk dan meningkatkan kecenderungan pelajar supaya mempunyai minat untuk berkecimpung dalam bidang reka bentuk selepas menamatkan pengajian mereka di Fakulti Kejuruteraan Pembuatan khasnya dan UTeM amnya.

(v) Meningkatkan kemampuan pelajar dalam komunikasi teknikal melalui pembentangan seminar, persembahan laporan teknikal dan pengendalian pameran.

Projek "Recycle Rack" yang dijalankan oleh Nur Fasihah Abdullah dan Siti Norshahidah Said telah dipilih sebagai projek terbaik kali ini.

Jadual di bawah menunjukkan senarai projek reka bentuk yang telah dihasilkan oleh 44 pelajar tahun akhir kursus Diploma Kejuruteraan Pembuatan ini.

| Kump. | Nama Pelajar | Projek |
|---|---|---|
| 1 | 1) NORHIDAYAH BT HASHIM<br>2) NOR FATIHAH BT MOHD ZIN | RECYCLE HYDROPONIC CONTAINER |
| 2 | 1) MUHAMAD AMRAN BIN IBRAHIM<br>2) WAN NASUHA BT W MALEK | AUTOMATED REVERSE VENDING MACHINE |
| 3 | 1) NUR HAFIZ BIN ISMAIL<br>2) SYED MUHAMAD HAZWAN BUN SAYED ALI | DAPUR HABA |
| 4 | 1) MOHD SHAHZUDDIN BIN SALLEH<br>2) ISMAIL BIN IBRAHIM | KINCIR AIR |
| 5 | 1) FEVILIA NURNADIA BT ADRIA SYAIFOEL<br>2) NURUL FARAH ADIBAH BT MOHD | MULTIFUNCTION GRATER |
| 6 | 1) MOHAMAD AZUAN BIN MOHD ZIN<br>2) MOHAMMAD HAFIZ ATQA BIN MOHD BAKRI | YELLOW DWARF HEAT STONE |
| 7 | 1) BADRUL HISHAM BIN AHMAD<br>2) MUHAMMAD AIZAT BIN ABD RAHIM | RECYCLE HEADPHONE |
| 8 | 1) MOHAMMAD FARHIN SADIRAN<br>2) MOHD MUHAIMIN JAMIL | AUTOMATIC HOUSE DOOR LOCKING SYSTEM |
| 9 | 1) MOHAMAD HANIF BIN TU-MIN<br>2) MOHD NAZIF BIN ROSLI | ALAT BANTU MEMBERSIH KIPAS |
| 10 | 1) AHMAD SUBANDI BIN KHA-YATUL CHAERON<br>2) ANAZ MUJAHID BIN MOHD KHAIR | HYEGIENCE SPOON |
| 11 | 1) HAMIZAH BT HAMZAH<br>2) NURULHUDA BT ABD RAHIM | MESIN PENCUCI KERANG |
| 12 | 1) REDZUAN BIN MOHD ZIN<br>2) SAIFUL ANUAR BIN MAT SAM | PORTABLE DESK |
| 13 | 1) MOHD FIRDHAUS BIN ISMAIL<br>2) MOHD AMIR SHARIFUDDIN ABD RAHIM | KATIL ANAK PATUNG |
| 14 | 1) NURIL ANUAR BIN BAKRI<br>2) MOHD IZZAT IKRAN | TRO-CYCLE |
| 15 | 1) JASON LOO KIN HOE<br>2) MAZRITHA BINTI NEZAM MUDEEN | INNOVATIVE HYROPONIC WATER FILTER SYSTEM |
| 16 | 1) MUHAMMAD HELMIE BIN ASNAN<br>2) YASIR BIN YAZID | PELINDUNG MOTOSIKAL |
| 17 | 1) DANNY JOINIM<br>2) IZZUAN BIN AHMAD | WATER RUBBISH TRAP |
| 18 | 1) MOHD ARIF ASMAWI BIN A RAHIM<br>2) MOHD AZRUL EZZAT BIN AZID | MULTIPURPOSE TABLE |
| 19 | 1) NORAINI BT MOHD YUSOF<br>2) NOR MARSILAH BT MAR-JUNET | PORTABLE CAN HOLDER |
| 20 | 1) NUR FASIHAH BT ABDULLAH<br>2) SITI NORSHAHIDAH BT SAID | RECYCLE RACK |
| 21 | 1) MUHAMMAD FIRDAUS BIN ABD JABAR<br>2) MOHD AZRIN BIN ABDUL | TROLI MUDAH ALIH |
| 22 | 1) ZURAIDAH ABDUL MAJID<br>2) MUH FAQRUL REDUAN | DRAIN CLEANER |

# PROGRAM / AKTIVITI YANG DIANJURKAN OLEH FKP

| BIL | PROGRAM/AKTIVITI | TARIKH | TEMPAT | ANJURAN |
|---|---|---|---|---|
| 1 | Syarahan Umum Pelantikan Proffesor | 11 Februari 2009 | Auditorium UTeM | Fakulti Kejuruteraan Pembuatan |
| 2 | Lawatan Sambil Belajar - (UniMAP & JMTi) | 15-17 Feb 2009 | UniMAP & JMTi | Fakulti Kejuruteraan Pembuatan |
| 3 | Kem Jati Diri Mahasiswa Siri 1/2009 | 27 Feb - 1 Mac 2009 | Nur Lembah Pangsun, Ulu Langat, Selangor | Fakulti Kejuruteraan Pembuatan |
| 4 | Lawatan Industri Ke Impresive Edge Group Berhad | 11 Mac 2009 | Impresive Edge | Jabatan Pengurusan Pembuatan |
| 5 | Ceramah Kerjaya Pelajar Tahun Akhir BMFP | 14 Mac 2009 | Bilik Kuliah 5, Bangunan Akademik, Kampus Industri | Jabatan Proses Pembuatan |
| 6 | Bengkel Menempuh Alam Pekerjaan | 28 Mac 2009 | Bilik Kuliah 13, Bangunan Akademik, Kampus Industri | Jabatan Proses Pembuatan |
| 7 | Seminar Industri | 1-Apr-09 | Dewan UTeM 1 | Jabatan Proses Pem- |
| 8 | Ceramah Kerjaya dan Motivasi (Siri III) | 2-Apr-09 | Sek. Men Keb. Ayer Keroh, Melaka | FKP |
| 9 | Ceramah Industri | 4-Apr-09 | Kafeteria Kampus Industri | Jabatan Rekabentuk Pembuatan |
| 10 | Pertandingan Rekabentuk Bagi Subjek Rekabentuk dan Pembangunan Produk (BMFR 2113) | 9-Apr-09 | Kafeteria Kampus Industri | Jabatan Rekabentuk Pembuatan |
| 11 | Bengkel Buku Panduan Akademik Sesi 2009/2010 | 17-19 April 2009 | Allson Klana Hotel, Putra Nilai, Negeri Sembilan | Fakulti Kejuruteraan Pembuatan |
| 12 | Bengkel Penstrukturan Semula FKP (22 April 2009) | 22-Apr-09 | Ayer Keroh Country Resort | Fakulti Kejuruteraan Pembuatan |
| 13 | Bengkel Jabatan Bahan Kejuruteraan | 21-23 April 2009 | Bilik Mesyuarat Ting.7, Bangunan Akademik | Jabatan Bahan |
| 14 | Bengkel Permurnian Dokumentasi ISO 17025:2005 | 26-28 Mei 2009 | Makmal Industrial Engineering Fasa B, Kampus Industr | Jabatan Proses Pembuatan |
| 15 | Bengkel Pemantapan Akademik-Penawaran Kursus Baru | 3-Jun-09 | Kampus Bandar UTeM | Jabatan Rekabentuk Pembuatan |
| 16 | Seminar Pembuatan Prof. Bernard Hon | 11-Jun-09 | Auditorium UTeM | Fakulti Kejuruteraan Pembuatan |
| 17 | Bengkel pelaksanaan "Outcome- Based Education" | 16-Jun-09 | Dewan UTeM 1 | Fakulti Kejuruteraan Pembuatan |



## BENGKEL PEMANTAPAN SUBJEK BARU, JABATAN REKABENTUK PEMBUATAN

*Saifudin Hafiz Yahaya*

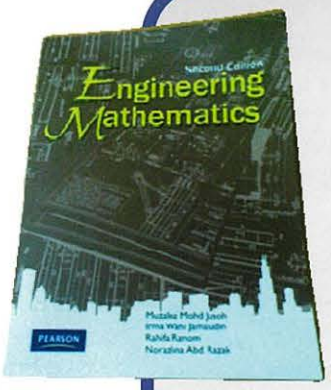
Bengkel pemantapan subjek baru, Jabatan Rekabentuk Pembuatan ini telah di adakan pada 3 Jun 2009 yang lalu bertempat di Bilik Mesyuarat, Tingkat 3, Bangunan Akademik, Kampus Industri UTeM. Antara tujuan bengkel ini dijalankan adalah untuk merangka pengisian dan panduan subjek baru secara terperinci dan berkesan kerana pertama kali ianya ditawarkan. Subjek-subjek baru yang ditawarkan mulai Semester 1, Sesi 2009/2010 adalah "Rapid Manufacturing", "Design For Environment", "Design Case Studies" dan "Design Project". Bengkel ini telah disertai oleh kesemua staf jabatan iaitu seramai 15 orang. Bengkel seumpama ini wajar di teruskan di masa akan datang untuk memastikan kualiti pengisian terutama subjek-subjek yang di tawarkan oleh FKP adalah terjamin dan mengikut senario terkini.

## PERJUMPAAN PELAJAR BERSAMA PA

*Saifudin Hafiz Yahaya*

Bertarikh 4 Februari 2009 yang lalu, telah berlangsungnya satu perjumpaan pelajar bersama penasihatan akademik, FKP. Perjumpaan ini telah dilangsungkan di Kafetaria, Kampus Industri, UTeM. Antara objektif yang disasarkan daripada perjumpaan ini adalah dapat menemukan para pensyarah bersama para pelajar di bawah seliaan penasihatan akademik melalui satu perjumpaan formal. Perjumpaan ini telah mensasarkan seramai 862 orang pelajar merangkumi pelajar tahun 1, 2 dan 4 serta diploma dengan kekuatan staf akademik seramai 70 orang. Majlis ini dimulakan dengan ucapan pembukaan oleh Dekan FKP, diikuti dengan penerangan sistem penasihatan akademik oleh timbalan dekan akademik dan seterusnya perjumpaan pelajar bersama penasihatan akademik. Kira-kira jam 10 malam, majlis perjumpaan ini telah selesai dengan jayanya.

# TEACHING MODULE




## ENGINEERING MATHEMATICS 2ND EDITION

**Authors**: ***Muzalna Mohd Jusoh, Rahifa Ranom, Irma Wani Jamaludin, Norazlina Abd. Razak***

Published by Pearson (M) Sdn. Bhd.
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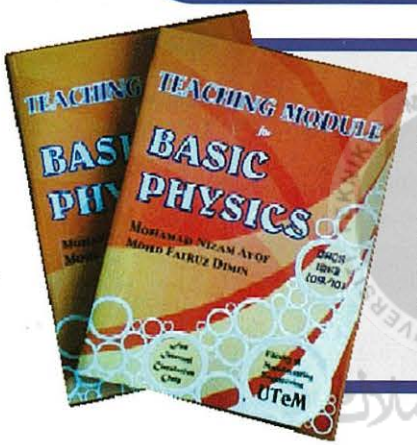
ENGINEERING MATHEMATICS is designed to serve as a study guide for engineering students of Universiti Teknikal Malaysia Melaka as well as others local university. The text consists of 3 chapters; Functions of Several Variables, Multiple Integrals and Vector Valued Function. Chapter 1 is an extended of basic calculus of single variable functions to multivariable functions. Chapter 2 considers the integral of a function of two variables over the plane region and a function of three variables over the space region. In Chapter 3, the authors introduce three-dimensional coordinate systems and vectors with their many applications. Exercises have been provided at the end of every chapter to improve an understanding.




## BASIC PHYSIC

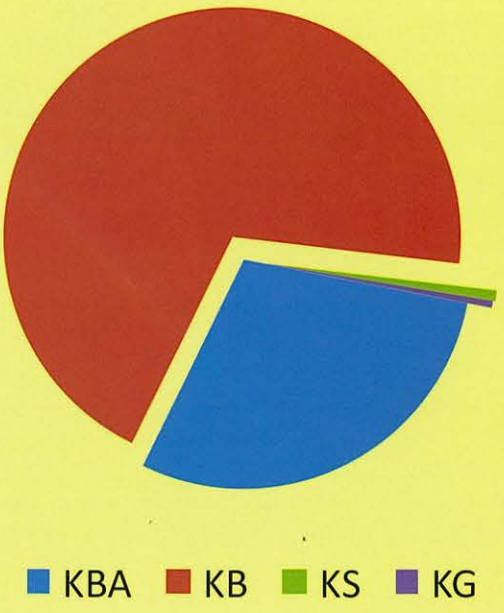
***Authors : Mohamad Nizam bin Ayof, Mohd Fairuz Dimin***

Mr. Mohamad Nizam Bin Ayof and Mr. Mohd Fairuz Dimin, staff from Department of Process, have developed a module for Basic Physic (DASC 1263). The module is used to support the teaching and learning process of the subject



# ANALISA KEPUTUSAN

**PEPERIKSAAN AKHIR SEMESTER 2, SESI 2008/2009**




Secara keseluruhan, keputusan pelajar pada Semester 2 Sesi 2008/2009 adalah memuaskan. Ringkasan analisa keputusan adalah seperti jadual di bawah.

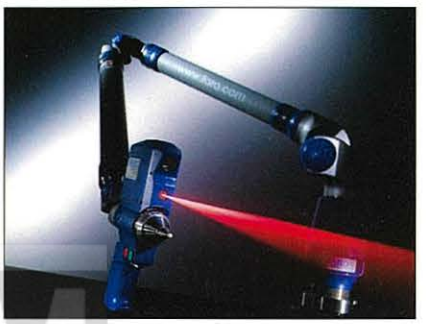
| | |
|---|---|
| **KBA (Kedudukan Baik Anugerah)** | 310 |
| **KB (Kedudukan Baik)** | 740 |
| **KS (Kedudukan Bersyarat)** | 8 |
| **KG (Kedudukan Gagal)** | 5 |
| **JUMLAH** | **1063** |

FKP news

# NEW EQUIPMENT

## PORTABLE COORDINATE MEASURING MACHINE

*Mohammad Kamil Sued*

On December 2008, Manufacturing Engineering Faculty (FKP) is equipped with state of the art technology by FARO. The FARO Laser ScanArm bought by FKP is the first ever seven-axis contact and non-contact measurement device with a fully integrated FARO Laser Line Probe. This technology is group under the portable coordinate measuring machine (CMM). Unlike other scanning systems, the FARO ScanArm's hard probe and FARO Laser Line Probe can digitize interchangeably without having to remove either component. Users can accurately measure prismatic features with the Arm's hard probe, then laser scan sections requiring larger volumes of data (more than 19,000 points per-second) without adding or removing attachments, untangling cabling, or having to use a separate CMM to import the data. The ScanArm's seventh axis affords further flexibility and has been designed for the integration of the laser line scanning probe. The extra degree of freedom allows optimum scanner positioning to obtain the best possible data. This extraordinary flexibility and the pistol grip also offer advantages with non scanning probes. The ScanArm is ideal for non-contact measurement applications, including inspection, cloud-to-CAD comparison, rapid prototyping, reverse engineering and 3-D modeling. It directly interfaces to the industry's leading point-cloud inspection and reverse-engineering softwares.

# MAJLIS BACAAN YASSIN

*Mohammad Kamil Sued*

Pada 9hb Jun 2009, Fakulti Kejuruteraan Pembuatan (FKP) telah mengadakan majlis bacaan yasin sempena perpindahan FKP daripada Kampus Industri, Ayer Keroh ke Kampus Tetap, Durian Tunggal. Majlis bacaan Yasin ini berlangsung di bangunan Kompleks Latihan Pembuatan (PFI) B. Majlis ini bermula pada jam 8:30 pagi dan dimulakan dengan ucapan aluan daripada Dekan FKP, Dr. Mohd Rizal bin Salleh. Majlis ini adalah bertujuan untuk menyampaikan maklumat dan berita terkini berkenaan aktiviti-aktiviti yang akan berlaku pada tarikh sebenar perpindahan FKP iaitu 19 sehingga 21 Julai 2001. Saudara Nik Mohd Farid bin Che Zainal Abidin selaku Pengurus Makmal telah memberikan beberapa penerangan dan jawapan kepada persoalan berkenaan perpindahan. Pada majlis ini juga, wakil daripada pejabat pembaggunan dan pengurusan aset iaitu arkitek Saudara Nik Ahmad Fikri bin Nik Ismail juga hadir untuk menyampaikan penerangan dan maklumat tambahan daripada pihak pejabat pembanggunan. Selain itu, tujuan utama majlis bacaan yasin ini adalah untuk mendapatkan keberkatan Ilahi supaya proses dan kerja-kerja perpindahan yang berlaku akan berjalan dengan lancar dan selamat. Majlis ini berakhir pada jam 10:00 pagi dengan jamuan kepada kesemua tetamu yang hadir.

# BENGKEL PENSTRUKTURAN SEMULA FAKULTI KEJURUTERAAN PEMBUATAN

*Nur Aidawaty Rafan*

Perpindahan Fakulti Kejuruteraan Pembuatan melibatkan beberapa perkara seperti perpindahan ruang , peralatan makmal, dokumen dan lain-lain lagi. Ini memerlukan perancangan yang teliti agar segala urusan perpindahan berjalan dengan lancar. Justeru, satu bengkel telah diadakan pada 22 April 2009 bertempat di Ayer Keroh D'Village, Ayer Keroh. Bengkel ini telah dijalankan seharian yang melibatkan penyelaras makmal dan juruteknik makmal-makmal fakulti. Tujuan utama bengkel ini adalah untuk merangka dan menyeragamkan draf pelan ruang makmal untuk disesuaikan dengan ruang yang diberikan di kampus tetap. Bengkel ini telah dimulai dengan ucapan ringkas dari Prof Dr Abu bin Abdullah yang menyentuh tentang kepentingan merangka strategi yang baik untuk perpindahan ini dan juga kerjasama yang diperlukan dari semua pihak. Kemudian, penerangan ringkas tentang objektif bengkel telah disampaikan oleh En Nik Mohd Farid selaku Ketua Jawatankuasa Perpindahan dan En Zolkarnain Marjom pula menyampaikan penerangan tentang penyeragaman dalam pelan lukisan yang perlu dilakukan. Kerjasama dari semua pihak yang telah ditunjukkan dalam menghasilkan pelan ruang amat menggalakkan dan diharapkan dapat diteruskan dalam meningkatkan kecemerlangan fakulti.

# Congratulations...

FKP news

Tahniah kepada 2 staf yang telah berjaya mendapatkan taraf "Professional Engineer' yang membawa gelaran Ir. Iaitu;

**Dr Ir Puvanasvaran A/L A. Perumal**
**Ir Sivarao A/L Subramonian**

Tahniah diucapkan kepada staf yang telah melangsungkan perkahwinan. Semoga mahligai yang dibina akan terus menyinar dan berkekalan. Amin...

**Raja Izamshah bin Raja Abdullah, Pensyarah**

**Muhamad Asari bin Abdul Rahim , Juruteknik**

**Nur Ain Zakirah binti Bahari, Penolong Akauntan**

Tahniah diucapkan kepada staf yang mendapat cahaya mata.

**En Mohamad Kamil bin Sued**
Anak : Nur Aisyah Husna (29 Jan 2009)

**En Mohd Ridzuan Jamli**
Anak : Danial Qayyum Mohamad Ridzuan (24 Mac 2009)

**Pn Suriati Akmal**
Anak : Muhammad Faris bin Fadli (2 Mei 2009)

**En Mohd Asyadi Azam**
Anak : Orked Arissa binti Mohd Asyadi Azam (31 Mei 2009)

**En Hairulhisham bin Rosnan**
Anak : Alif Aiman bin Hairulhisham (9 Jun 2009)

**En Saifudin Hafiz bin Yahaya**
Anak : Muhammad Haziq Haiqal (13 Jun 2009)

# PENGHARGAAN

FKP juga ingin merakamkan sekalung penghargaan dan mengalu-alukan pelantikan Dr Azizah Shaaban sebagai Timbalan Pengarah, Pusat Pengurusan Penyelidikan muali 23 Mac 2009 dan En Nizam bin Ayof sebagai Penyelaras Program Siswazah (Kerja Kursus), Pusat Pengajian Siswazah.

# WELCOME

FKP ingin mengucapkan tahniah ke atas pelantikan (pelbagai gred jawatan) kepada staf baru dan juga kepada staf yang baru pulang dari cuti belajar sepanjang tahun 2009 (Setengah tahun pertama) yang terdiri daripada :-

**Dr Lok Yian Yian**
Pensyarah Kanan DS52 (mulai 07 Jan 2009)

**Dr Noor Ajian binti Mohd Lair**
Pensyarah Kanan DS52 (mulai 26 Mei 2009)

**Dr Ir Puvanasvaran A/L A. Perumal**
Pensyarah Kanan DS52

**Dr Sugumar a/l Dharmalingam**
Pensyarah Kanan (mulai 04 Jan 2009)

**Dr Jariah binti Mohamad Juoi**
Pensyarah Kanan DS52 (mulai 20 Mac 2009)

**En Zulkifli bin Rosli**
Pensyarah

**En Hanizam bin Hashim**
Jurutera Pengajar J41 (mulai 04 Mei 2009)

**En Mohd Soufhwee bin Abd Rahman**
Jurutera Pengajar J41 (mulai 22 Mei 2009)

**Cik Zarina binti Ma'arip**
Jurutera Pengajar J41 (mulai 01 Jun 2009)

**En Mahasan bin Mat Ali**
Tutor Gred DA41 (mulai 1 Apr 2009)

**Cik Masni-Azian binti Akiah**
Tutor Gred DA 41 (mulai 23 Jun 2009)

# all the best

Fakulti telah menghantar 11 orang staf pada tahun 2009 (Pertengahan Pertama) bagi melanjutkan pengajian ke Peringkat Doktor Falsafah (PhD) dan juga Ijazah Sarjana (MSc).

**Pn. Ruzy Haryati bt. Hambali** (PhD)/UK
**En. Muhammad Hafidz Fazli b Md Fauadi** (PhD)/ Jepun
**En. Muhamad Arfauz b. A. Rahman** (PhD)/Australia
**En. Wan Hasrulnizzam Wan Mahmood** (PhD)/UPM
**En. Mohd Edeerozey bin Abd Manaf** (PhD)/Jepun
**En. Mohd. Amri b. Sulaiman** (PhD)/UKM
**En. Mohd. Shahir b. Kasim** (PhD)/UKM
**En. Azrul Azwan b. Abd. Rahman** (Sangkut Industri)/ Germany
**Cik Chang Siang Yee** (MSc)/USM
**En. Muhammad Syafik bin Jumali** (MSc)/UTeM

# Salam Perantauan

Oleh Syamimi Shamsuddin

## En Mohamad Minhat

*Lokasi* : Auckland, New Zealand
*Nama isteri* : Afidah Binti Bidin
*Anak-anak*: Ahmad Luqman, Afiqah Naimi, Aqmar Naimi, Ahmad Ikhwan
*Ucapan ringkas*
"Saya, Mohamad bin Minhat, no. pekerja 00107, staf jabatan proses pembuatan FKP, serta ahli keluarga ingin mengucapkan selamat aidilfitri 'minal aidil wal faizil' dari ceruk rantau Auckland NZ kutub selatan. Ucapan buat rakan, taulan, sahabat, serta musuh (jika ada, saya pun dah lupa siapa) dekat dan jauh. Maaf kan saya serta kami sekeluarga atas segala kekurangan fizikal serta akhlak budi pekerti. Jaga diri hiasi peribadi."

## En Shajahan Maidin

*Lokasi* : Loughborough, United Kingdom
*Isteri & anak-anak* : Latifah, Muhammad Shariq & Muhammad Shaqif
*Ucapan :*
Di kesempatan ini, saya mengucapkan Selamat Menyambut Hari Raya Aidilfitri kepada semua sahabat dan kenalan terutamanya di FKP dan UTeM.
Salam ucapan Aidilfitri, Maaf Zahir dan Batin.

## En Mohd Hadzley Abu Bakar

*Lokasi* : Southbank, London.
*Ucapan* :
Selamat Hari Raya Aidilfitri dari kami yang jauh,
Mohd Hadzley Abu Bakar
dan Rosnah Mohamed.



## Puan Ruzy Haryati Hambali

*Lokasi* : Liverpool, UK
*Suami & anak:* Ahmad Tarmizi & Deenee Kiasatina
*Ucapan ringkas* :
Salam lebaran untuk seluruh warga FKP_kp yang disayangi dan dirindui. Semoga terus mendapat keberkatan dan keceriaan pada Aidilfitri tahun ini.

## En. Muhamad Arfauz A. Rahman

*Lokasi* : Melbourne, Australia
*Nama isteri* : Shahaneen Bte Johari
*Ucapan ringkas*
Ingatan tulus ikhlas dan salam aidilfitri untuk semua rakan-rakan FKP yang sentiasa di hati, terutama sekali buat teman-teman rapat yang banyak membantu dalam segala urusan semasa di FKP maaf zahir & batin... juga mohon doakan kami sentiasa dipermudahkan urusan di perantauan..

## Cik Zaleha Mustafa

*Lokasi* : Glasgow, Scotland
*Ucapan ringkas :*
Salam Lebaran & maaf zahir batin untuk semua warga FKP di Malaysia.

# Salam Perantauan

Oleh Syamimi Shamsuddin



## En Zulkeflee bin Abdullah

*Lokasi* : Melbourne, Australia
Isteri : Nor Ratna bt Masrom
Anak-anak :
Nor Zulaikha, Muhammad Zuliskandar,
Nor Zuhaira, Nor Zuraini Zubaidah
*Ucapan ringkas* :
Selamat Menyambut Hari Raya Aidilfitri.
Semoga keluarga FKP terus cemerlang di masa depan.


## En. Hazman bin Hasib

Lokasi :
NC State University, Raleigh, USA
*Ucapan ringkas*
Selamat berpuasa dan
Hari Raya Aidilfitri
kepada semua warga FKP.
Semoga berjumpa kembali
tahun hadapan.
Maaf zahir dan batin.

## Pn Rahimah bt Abdul Hamid

Lokasi : Aachen, Jerman
Suami & anak : Yushairee Yusoff, Irfan Danisch
Ucapan ringkas :
Saya sekeluarga ingin mengucapkan
Selamat Hari Raya Aidilfitri kepada rakan-rakan
di FKP khususnya dan semua warga UTeM amnya.
Maaf zahir & Batin.

## En. Azrul Azwan Abdul Rahman

Lokasi : Berlin, Jerman
Nama isteri & anak :
Hannan & Afif Ahza

## Cik Zuhriah Ebrahim

Lokasi : Cardiff University, UK
Ucapan ringkas :
Selamat hari raya aidilfitri untuk semua staf FKP yang masih mengingati dan mengenali saya... dan tidak lupa kepada staf FKP yang baru mengenali saya melalui ruangan ini...
dengan rahmat dan berkat bulan Ramadhan dan Syawal...
semoga bertambah erat silaturrahim sesama kita...

Salam Aidilfitri diucapkan untuk staff FKP dan khususnya team Jabatan Bahan Kejuruteraan. Mohon maaf dipinta andai tersalah bicara dan perlakuan sepanjang tempoh bergelar staff FKP.

Dari kami,
Zurina & Azri
Ayu Mierza Zahra & Ayu Mierza Hana
University of Sheffield

## Puan Seri Rahayu Kamat

Lokasi : Sheffield, UK
Ucapan :
Selamat Hari Raya& maaf zahir batin
dari kak Ayu sekeluarga.

# Autograph



# THE lean

FACULTY OF MANUFACTURING ENGINEERING

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