PANDUAN AKADEMIK

PROGRAM DIPLOMA KEJURUTERAAN

UNIVERSITI MALAYSIA PERLIS

SIDANG AKADEMIK 2019/2020

ILMU • KEIKHLASAN • KECEMERLANGAN

EDITOR

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dan
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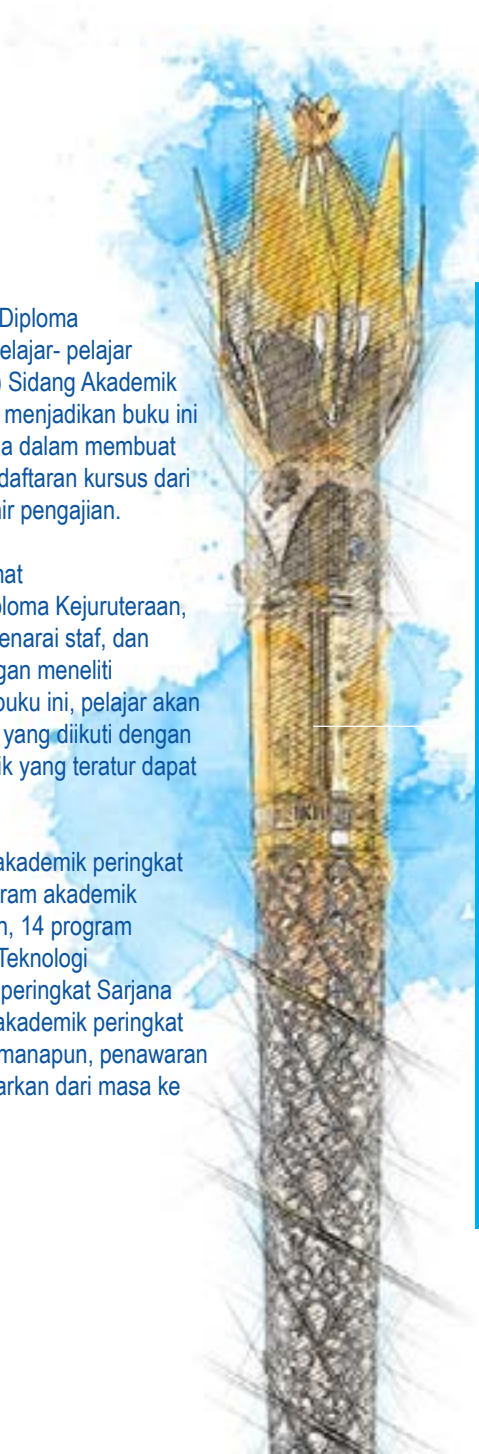
Dekan Fakulti Teknologi Kejuruteraan,
Dekan Institut Matematik Kejuruteraan,
Pengarah Pusat Kerjasama Industri dan Agensi Kerajaan,
Pengarah Pusat Bahasa Antarabangsa
Pengarah Pusat Ko-Kurikulum

ISI KANDUNGAN

*Dari semasa ke semasa, pihak Universiti Malaysia Perlis (UniMAP) mungkin melakukan perubahan ke atas beberapa aspek kurikulum dan sistem akademik bagi memenuhi keperluan semasa. Perubahan ini, sekiranya ada, akan hkan diheba kepada pelajar. Semua pelajar adalah tertakluk kepada perubahan tersebut.

1.0 Pendahuluan



Buku Panduan Akademik Program Diploma Kejuruteraan ini disediakan untuk pelajar- pelajar Universiti Malaysia Perlis (UniMAP) Sidang Akademik 2019/2020. Para pelajar hendaklah menjadikan buku ini sebagai panduan dan rujukan utama dalam membuat perancangan dan menentukan pendaftaran kursus dari tahun pertama hingga ke tahun akhir pengajian.

Buku ini juga mengandungi maklumat asas tentang struktur Akademik Diploma Kejuruteraan, sistem akademik, senarai kursus, senarai staf, dan maklumat lain yang berkaitan. Dengan meneliti maklumat yang terkandung dalam buku ini, pelajar akan dapat memahami sistem pengajian yang diikuti dengan jelas supaya perancangan akademik yang teratur dapat difikir dan dilaksanakan.

UniMAP menawarkan 14 program akademik peringkat Sarjana Muda Kejuruteraan, 2 program akademik peringkat Sarjana Muda Perniagaan, 14 program akademik peringkat Sarjana Muda Teknologi Kejuruteraan, 1 program akademik peringkat Sarjana Muda Sains Sosial dan 6 program akademik peringkat Diploma Kejuruteraan. Walaubagaimanapun, penawaran program- program baru akan ditawarkan dari masa ke semasa.

Penawaran 6 Program peringkat Diploma Kejuruteraan adalah seperti berikut:

- Diploma Kejuruteraan Elektrik
- Diploma Kejuruteraan Komputer
- Diploma Kejuruteraan Mekatronik
- Diploma Kejuruteraan Metalurgi
- Diploma Kejuruteraan Elektronik
- Diploma Kejuruteraan Pembuatan

Pusat-pusat pengajian yang terdapat di UniMAP adalah seperti berikut:

Pusat Pengajian Diploma
Pusat Pengajian Kejuruteraan Sistem Elektrik
Pusat Pengajian Kejuruteraan Komputer & Perhubungan
Pusat Pengajian Kejuruteraan Mekatronik
Pusat Pengajian Kejuruteraan Bahan
Pusat Pengajian Kejuruteraan Mikroelektronik Pusat Pengajian Kejuruteraan Pembuatan
Pusat Pengajian Kejuruteraan Bioproses
Pusat Pengajian Kejuruteraan Alam Sekitar
Pusat Pengajian Inovasi Perniagaan & Teknousahawan
Fakulti Teknologi Kejuruteraan

VISI

Institusi akademik dan penyelidikan yang berdaya saing di persada antarabangsa.

MISI

Melahirkan insan kamil yang menyumbang kepada agenda pembangunan dan daya saing industri negara.

Lagu Universiti : WAWASANKU

Universiti Malaysia Perlis
Alam Kejuruteraan
Ilmu, Keikhlasan, Kecemerlangan
Wawasan jiwa kita
Berdikari rohaniah Berteknologi
Pemimpin berbestari
Untuk bangsa, insan dan umat dunia
Negara yang tercinta
Universiti Malaysia Perlis
Alam Kejuruteraan
Ilmu, Keikhlasan, Kecemerlangan
Wawasan jiwa kita

DULI YANG TERAMAT MULIA
TUANKU SYED FAIZUDDIN PUTRA
IBNI TUANKU SYED SIRAJUDDIN JAMALULLAIL

D.K., S.P.M.P., P.A.T., Doctor of Education (Honoris Causa) La Trobe University Melbourne, Australia Honorary Doctorate in Management Sciences, Yala Rajabhat University, Thailand

RAJA MUDA PERLIS
(CANSELOR UNIVERSITI MALAYSIA PERLIS)

DULI YANG TERAMAT MULIA
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RAJA PUAN MUDA PERLIS
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5.0 Kata Aluan Dekan

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Dekan
Pusat Pengajian
Diploma Universiti Malaysia Perlis

Pertama sekali, Selamat datang saya ucapkan kepada saudara/saudari yang telah berjaya melanjutkan pengajian ke Universiti Malaysia Perlis, UniMAP. Terima kasih memilih UniMAP.

Syukur Alhamdulillah dan Tahniah kepada saudara/saudari kerana menjadi insan-insan terpilih untuk berada di UniMAP bagi menelaah ilmu sebanyak mungkin sebelum menjadi warganegara yang mempunyai mentaliti kelas pertama. UniMAP amat komited ke arah meningkatkan ilmu pengetahuan, mengasah bakat dan meluaskan minda saudara/saudari melalui pendekatan pengajaran dan pembelajaran yang berkesan. Saudara/saudari akan bersama-sama UniMAP dalam misi ke arah membentuk insan kamil yang menjadi penyumbang kepada pembangunan negara.

Saudara/saudari merupakan aset penting bagi membentuk barisan penjana pembangunan negara dalam pengurusan sumber manusia negara. Jesteru itu, menjadi tugas dan tanggungjawab saudara/saudari sekalian untuk berusaha serta memperkemaskan diri dengan pelbagai kemahiran dan pengetahuan selaras dengan keperluan industri mahupun Negara agar dapat bersaing di peringkat global bagi merealisasikan aspirasi negara dan seterusnya menyumbang kepada ketamadunan dunia

Besarlah harapan UniMAP, setiap saudara/saudari warga UniMAP akan menjadi pemimpin kepada kecemerlangan bukan sahaja kepada orang lain malah menjadi pemimpin kepada diri sendiri supaya menjadi manusia cemerlang dalam pelajaran dan juga hidup. Saudara/ saudari yang berjiwa cemerlang mestilah berani menyahut apa jua cabaran untuk memajukan diri disamping pandai untuk memartabatkan masa sebaik mungkin semasa berada di puncak menara gading ini.

Saudara/saudari haruslah berusaha membuktikan kecemerlangan diri bukan sahaja melalui akademik tetapi melalui sahsiah diri yang ditunjukkan kerana itu pasti akan menjadi bukti kejayaan di sini. Cabaran globalisasi pada masa akan datang juga dapat dihadapi dengan menjadikan UniMAP sebagai medan ilmu untuk melengkapkan diri saudara/saudari dari segi mental dan fizikal.

Akhir kata, seluruh warga kerja UniMAP meletakkan harapan yang tinggi pada saudara/ saudari agar dapat memanfaatkan kecemerlangan ilmu yang akan ditimba sepanjang pembelajaran di UniMAP seterusnya dapat menyumbangkan jasa kepada agama, bangsa dan Negara kelak. Jagalah amanah dan tanggungjawab yang telah diberikan oleh kedua ibu bapa dalam menuntut ilmu demi kepentingan diri, keluarga, masyarakat dan negara.

Sekian, Wassalam.

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NAIB CANSELOR

PROF. DR. UDA HASHIM
TIMBALAN NAIB CANSELOR
(PENYELIDIKAN & INOVASI)

PROF.IR. DR. HAJI REZUWAN
HAJI KAMARUDDIN
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PROF. MADYA DR.
MOHD FOAD SAKDAN
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(HAL EHWAL PELAJAR & ALUMNI)

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BENDAHARI

YBRS. TN. HJ.
MOHD SAAD BIN DIN
PENDAFTAR

PUAN MAZMIN MAT AKHIR
KETUA PUSTAKAWAN

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PROF MADYA DR HANIMAH OSMAN
Dekan
Pusat Pengajian Diploma

Ts DK SUHAREZA MD ESA
Timbalan Dekan
Akademik dan Penyelidikan

Ts EN MOHD ROSYDI BIN ZAKARIA
Timbalan Dekan
Pembangunan Pelajar dan Alumni

EN MOHAMAD SHUKOR BIN ABDUL RAHIM
Pengerusi Rancangan Diploma
Kejuruteraan Elektrik

Ts PN NAZATUL SIMA BTSAAD
Pengerusi Rancangan Diploma
Kejuruteraan Komputer

PN NORAZLA BT GHOSI
Pengerusi Rancangan Diploma Kejuruteraan
Mekatronik

Ts EN MUHAMMAD HAFIZ BIN ZAKARIA
Pengerusi Rancangan Diploma Kejuruteraan
Metalurgi

Ts Dr NOR ZAIDAH BIN YAHAYA
Pengerusi Rancangan Diploma Kejuruteraan
Pembuatan

Ts PN AESIN BT KAMARUDIN
Pengerusi Rancangan Diploma Kejuruteraan
Elektronik

Ts Dr ALLAN MELVIN ANDREW
Penyelaras
Jaringan Industri dan Pengurusan Kualiti

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SETIAUSAHA PEJABAT
NUR EILMIAH AHMAD DAUD

PENOLONG PENDAFTAR
PN. SITI SALWA RAHIM

PEMBANTU PENOLONG PENDAFTAR
NOR AFIFAH SHABUDIN

PEMBANTU TADBIR
EN MOHD HAFIZI ZALMI

PEMBANTUTADBIR
EN MOHD FAIZAN KASIM

PEMBANTU AM PEJABAT
MOHD FIRDAUS SHAMSHUL

mengucapkan

SELAMAT DATANG

KEPADA SEMUA SISWA SISWI
SESI PENGAMBILAN DIPLOMA KEJURUTERAAN BAGI TAHUN 2019/2020

• • •

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PROGRAM DIPLOMA KEJURUTERAAN MEKATRONIK

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8.0 Latarbelakang UniMAP

Sejajar dengan lonjakan industri, ilmu serta keperluan melahirkan lebih banyak modal insan dalam bidang kejuruteraan di Malaysia, maka Universiti Malaysia Perlis (UniMAP), universiti awam yang ke-17, telah ditubuhkan oleh kerajaan pada tahun 2002. UniMAP yang dulunya dikenali sebagai Kolej Universiti Kejuruteraan Utara Malaysia (KUKUM) menerusi proses penjenamaan semula pada 1 Februari 2007 telah ditubuhkan di bawah Seksyen 20 Akta Universiti dan Kolej Universiti 1971 (Akta 30) menerusi Perintah Kolej Universiti Kejuruteraan Utara Malaysia (Pemerbadanan 2002) yang telah diwartakan sebagai P.U (A) 378 pada 12 September 2002.

Dalam usaha untuk menjadikan UniMAP sebagai sebuah universiti yang berdaya saing dan tersohor di persada antarabangsa, konsep penting telah diterapkan dalam visi dan misi UniMAP selaras dengan moto UniMAP iaitu "Ilmu, Keikhlasan, Kecemerlangan". Ini sejajar dengan visi UniMAP iaitu untuk menjadi "Institusi Akademik dan Penyelidikan yang Berdaya Saing di Persada Antarabangsa" dan misi UniMAP untuk "Melahirkan Modal Insan yang Menyumbang Kepada Agenda Pembangunan dan Daya Saing Industri Negara".

UniMAP menawarkan sebanyak 14 program akademik peringkat Sarjana Muda Kejuruteraan, 14 program akademik peringkat Sarjana Muda Teknologi Kejuruteraan, 2 program akademik peringkat Sarjana Muda Perniagaan, dan 1 program akademik peringkat Sarjana Muda Komunikasi Media serta 6 program akademik peringkat Diploma Kejuruteraan melalui 6 daripada keseluruhan 11 buah pusat pengajian.

Penambahbaikan secara komprehensif sistem penyampaian pendidikan, latihan dan pembelajaran akan dilaksanakan dengan program-program baru ditawarkan dari semasa ke semasa. Kurikulum peringkat Diploma Kejuruteraan yang disediakan di UniMAP direkabentuk dengan mengambil kira keperluan pasaran tenaga kerja dalam negara. Kursus-kursusnya pula menyatukan komponen teori dan amali mengikut keperluan industri dengan jangka masa pengajian selama 3 tahun. Pelajar Diploma Kejuruteraan di UniMAP juga dibekalkan dengan kursus Keperluan Universiti dan pembangunan sahsiah demi melahirkan Pembantu Jurutera yang bukan sahaja cekap dalam bidang yang mereka ikuti, tetapi juga berkebolehan untuk berdikari serta punya sikap keterampilan diri yang tinggi.

9.0 Objektif Pendidikan Program (PEO)

Objektif Pendidikan Program (Programme Educational Objectives) untuk keseluruhan program Diploma Kejuruteraan di Universiti Malaysia Perlis (UniMAP) adalah seperti berikut:

1. Graduan adalah kompetensi dalam bidang kejuruteraan masing-masing seperti yang ditunjukkan melalui perkembangan kerjayanya.

2. Graduan yang terlibat dalam menyumbang kepada masyarakat.

3. Graduan meneruskan peluang pendidikan yang berterusan

4. Graduan membuat sumbangan melalui inovasi dan keusahawanan.

The Educational Objectives Program for the entire Diploma in engineering program at Universiti Malaysia Perlis (UniMAP) is as follows:

1. Graduates are competence in their respective engineering field as demonstrated through career progression.

2. Graduates who are involve and contribute towards societies.

3. Graduates pursue continuing education opportunities.

4. Graduates make contribution through innovation and entrepreneurship.

10.0 Hasil Program (PO)

Hasil program (Programme Outcome) pembelajaran yang akan diperolehi oleh pelajar - pelajar yang mengikuti Program Diploma Kejuruteraan di UniMAP adalah seperti berikut:

Pengetahuan Teknikal dan Kecekapan

1. Keupayaan untuk menerapkan pengetahuan asas matematik, sains, dan kejuruteraan kepada prosedur dan amalan kejuruteraan yang jelas.
2. Keupayaan untuk menganalisis masalah kejuruteraan yang jelas dalam disiplin kejuruteraan tertentu
3. Keupayaan untuk memohon pelbagai teknik, kemahiran dan alat peminat untuk aktiviti kejuruteraan yang jelas
4. Keupayaan untuk menjalankan penyiasatan dan membantu dalam reka bentuk penyelesaian untuk sistem kejuruteraan masing-masing.

Kemahiran insaniah

5. Pengiktirafan keperluan, dan keupayaan untuk terlibat dalam pembelajaran sepanjang hayat.
6. Keupayaan untuk berkomunikasi dengan berkesan bukan hanya dengan rakan sekerja tetapi juga dengan komuniti secara keseluruhan.
7. Keupayaan untuk menunjukkan kesedaran mengenai pertimbangan terhadap isu-isu sosial, kesihatan, keselamatan, undang-undang dan kebudayaan dan tanggungjawab mereka.
8. Keupayaan untuk berfungsi secara berkesan sebagai individu dan dalam pasukan.
9. Keupayaan untuk menunjukkan pemahaman tentang etika, tanggungjawab dan norma amalan kejuruteraan profesional.
10. Keupayaan untuk menunjukkan kesedaran pengurusan, amalan perniagaan dan keusahawanan.
11. Keupayaan untuk menunjukkan pemahaman mengenai kesan amalan kejuruteraan dengan mempertimbangkan keperluan pembangunan mampan

The programme Outcome of the study that will be obtained by students who are attending the Diploma in Engineering Program at UniMAP are as follows:

Technical Knowledge and Competencies

1. Ability to apply knowledge of mathematics, science, and engineering fundamentals to well-defined engineering procedures and practices.
2. Ability to analyze well-defined engineering problems in specific engineering discipline.
3. Ability to apply various techniques, skills andengineering tools to well-defined engineering activities.
4. Ability to conduct investigations and assist in the design of solutions for respective engineering systems.

Soft Skills

5. Recognition of the need for, and ability to engage in life-long learning.
6. Ability to communicate effectively not only with colleagues but also with the community at large.
7. Ability to demonstrate an awareness of consideration for societal, health, safety, legal and cultural issues and their consequent responsibilities.
8. Ability to function effectively as an individual and in teams.
9. Ability to demonstrate an understanding of professional ethics, responsibilities and norms of engineering practices.
10. Ability to demonstrate an awareness of management, business practices and entrepreneurship.
11. Ability to demonstrate an understanding of the impact of engineering practice by considering the need of sustainable development

11.0 KALENDAR AKADEMIK DIPLOMA

AKTIVITI	SEMESTER PERTAMA 17 Jun 2019 hingga 1 Disember 2019		
	JANGKA MASA	TEMPOH	CATATAN
Pendaftaran Pelajar Baru / Minggu Suai Kenal	17 Jun hingga 23 Jun 2019	7 Hari	Hari Keputeraan DYMM Raja Perlis 17 Julai 2019 (Rabu)
Kuliah	24 Jun hingga 11 Ogos	7 Minggu	
Cuti Pertengahan Semester	12 Ogos hingga 18 Ogos 2019		Hari Raya Aidiladha 11 & 12 Ogos 2019 [Ahad & Isnin]
Kuliah	19 Ogos hingga 6 Oktober 2019	7 Minggu	Hari Kebangsaan 31 Ogos 2018 [Sabtu] Hari Keputeraan YDP Agong 9 September 2018 [Isnin] Awal Muharram 1 September 2018 [Ahad] Hari Malaysia 16 September 2018 [Isnin]
Minggu Ulangkaji	7 Oktober hingga 13 Oktober 2019		
Peperiksaan	14 Oktober 2019 hingga 3 November 2019	3 Minggu	Hari Deepavali 27 Oktober 2019 [Ahad]
Cuti Antara Semester	4 November 2019 hingga 1 Disember 2019	4 Minggu	Maulidur Rasul 9 November 2019 [Sabtu]

AKTIVITI	SEMESTER KEDUA 2 Disember 2019 hingga 12 April 2020		
	JANGKA MASA	TEMPOH	CATATAN
Kuliah	2 Disember 2019 hingga 26 Januari 2020	8 Minggu	Hari Krismas 25 Disember 2019 Tahun Baru Cina 25 dan 26 Januari 2020 [Sabtu & Ahad]
Cuti Pertengahan Semester	27 Januari hingga 2 Februari 2019		
Kuliah	3 Februari hingga 15 Mac 2020	6 Minggu	
Minggu Ulangkaji	16 Mac hingga 22 Mac 2020		Israk mikraj 22 Mac 2020 (Ahad)
Peperiksaan	23 Mac hingga 12 April 2020	3 Minggu	
Cuti Panjang	13 April hingga 21 Jun 2020	10 Minggu	Hari Pekerja 1 Mei 2020 (Jumaat) Hari Wesak 7 Mei 2020 (Khamis) Nuzul Al- Quran 10 Mei 2020 (Ahad) Hari Raya Aidilfitri 24 & 25 Mei 2020 (Ahad & Isnin)

12.0 SYARAT KEMASUKAN

KATEGORI A
(Lepasan SPM tahun 2018)
&
KATEGORI B
(Lepasan SPM tahun 2016 atau 2017)

R 2404	**Diploma Kejuruteraan Komputer (6 Semester)**
R 2420	**Diploma Kejuruteraan Elektrik (6 Semester)**
R 2423	**Diploma Kejuruteraan Mekatronik (6 Semester)**
R 2427	**Diploma Kejuruteraan Elektronik (6 Semester)**
R 2432	**Diploma Kejuruteraan Pembuatan (6 Semester)**
R 2433	**Diploma Kejuruteraan Metalurgi (6 Semester)**

Syarat Am Universiti

Memiliki sijil SPM / setaraf dengan mendapat sekurang-kurangnya **Lima (5) Kepujian (Gred C) termasuk Bahasa Melayu** dan **Lulus (Gred E)** dalam mata pelajaran **Sejarah** (SPM tahun **2013** dan ke atas)

SYARAT KHAS PROGRAM

Memenuhi Syarat Am Universiti
serta
Syarat Khas Program

1. Mendapat sekurang-kurangnya **Kepujian (Gred C)** dalam mata pelajaran berikut:

   a. **Matematik**, dan

   b. Salah **SATU (1)** daripada mata pelajaran berikut:
   - Fizik
   - Kimia
   - Biologi
   - Pengajian Kejuruteraan Mekanikal
   - Pengajian Kejuruteraan Awam
   - Pengajian Kejuruteraan Elektrik dan Elektronik
   - Teknologi Kejuruteraan
   - Lukisan Kejuruteraan
   - Reka Cipta

2. Mendapat sekurang-kurangnya **Lulus Atas (Gred D)** dalam mata pelajaran **Matematik Tambahan**

dan

3. Mendapat sekurang-kurangnya **Lulus (Gred E)** dalam mata pelajaran **Bahasa Inggeris**

dan

4. Calon tidak buta warna dan tidak cacat anggota sehingga menyukarkan kerja amali.

13.0 SISTEM AKADEMIK

SISTEM AKADEMIK

Kurikulum Program Diploma Kejuruteraan dirangka untuk dilengkapkan dalam tempoh 3 tahun. Setiap Tahun Akademik atau Sidang Akademik dibahagikan kepada Semester I dan Semester II. Setiap semester mengandungi 14 minggu pembelajaran. Peperiksaan akan diadakan pada hujung semester. Kursus-kursus yang ditawarkan dibahagikan mengikut peringkat pengajian iaitu peringkat 100, 200, 300 dan 400.

Bagi tujuan pengijazahan, pelajar Diploma Kejuruteraan perlu mengambil kursus-kursus Teras berjumlah 81 unit, dan 14 unit Kursus Keperluan Universiti.

Pelajar juga perlu lulus semua kursus dan mendapat jumlah kredit yang diperlukan mengikut program pengajian masing-masing serta PNGK sekurang-kurangnya 2.00 untuk bergraduat.

Perincian struktur kurikulum ini diberikan di dalam Jadual 1:

Jadual 1: Struktur Kurikulum

KURSUS		UNIT
KURSUS TERAS		81
ii. KURSUS KEPERLUAN UNIVERSITI		14
a. Bahasa Inggeris I	2	
b. Bahasa Inggeris II	2	
c. Bahasa Inggeris III	2	
d. Bahasa Melayu	2	
e. Pengajian Malaysia II	2	
f. Keusahawanan Kejuruteraan	2	
g. Badan Beruniform	2	
h. *Matematik Awalan	(*2 audit)	

JENIS-JENIS KURSUS

Kursus Keperluan Universiti

Kursus Keperluan Universiti ialah kursus-kursus di luar pengkhususan pelajar. Kursus-kursus ini ditawarkan oleh Pusat Pengajian Pembangunan Insan dan Teknokomunikasi (IKOM), Pusat Bahasa Antarabangsa dan Pusat Kokurikulum. Semua kursus ini wajib diambil dan pelajar perlu lulus dengan gred C sebagai syarat untuk pengijazahan. Kursus-kursus tersebut ialah:

a. Bahasa Inggeris Komunikasi I (DWW101) – (2 unit)
Semua pelajar wajib mengambil kursus ini dan lulus

b. Bahasa Inggeris Komunikasi II (DWW201) –
(2 unit) Pelajar boleh mendafar kursus ini
setelah:-
-Pelajar lulus DWW111 dan lulus sekurang-kurangnya minimum C

c. Bahasa Inggeris Komunikasi III (DWW301) –
(2 unit) Pelajar boleh mendafar kursus ini
setelah:-
-Pelajar lulus DWW211 dan lulus sekurang-kurangnya minimum C

d. Bahasa Melayu (DWW410) - (2 unit)
Kursus ini wajib diambil oleh semua pelajar

e. Pengajian Malaysia II (DUW239) – (2 unit)
Kursus ini wajib diambil oleh semua pelajar DAN lulus sekurang-kurangnya minimum C

f. Keusahawanan Kejuruteraan (DUW224) - (2 unit) '
Kursus ini wajib diambil oleh semua pelajar DAN lulus sekurang-kurangnya minimum C

g. Badan Beruniform (DZWXXX) - (2 unit)
Semua pelajar diwajibkan untuk mengumpul 2 unit kursus kokurikulum sepanjang pengajian di UniMAP Pelajar mestilah melengkapkan pakej kursus badan beruniform yang didaftar.

h. Matematik Awalan (DKA104) – (0 unit)
Kursus ini wajib kepada pelajar yang mendapat D dan kebawah dalam subjek Matematik dan wajib lulus

Pendekatan Pembelajaran dan Pengajaran

UniMAP menitikberatkan pendekatan pengajaran dan pembelajaran seiring dengan perkembangan industri,sama ada dalam bentuk komponen teori mahupun komponen amali. Kefahaman pelajar terhadap komponen teori dipertingkatkan melalui pembelajaran amali yang disediakan disamping komponen kemahiran, penyelesaian masalah, kerja berkumpulan, penyediaan dan perbentangan laporan.

Secara amnya, bagi sesebuah kursus Teras 3 unit, 2 unit terdiri dari komponen teori manakala 1 unit adalah komponen amali. Satu unit komponen teori terdiri dari 1 jam kuliah, manakala 1 unit komponen amali merangkumi 2 jam pembelajaran di dalam makmal. Kursus-kursus ini dirangka dengan sebegitu rupa agar, bagi kursus 3 unit, pelajar menjalani 2 jam kuliah, diikuti dengan 2 jam makmal dalam minggu pembelajaran. Namun begitu, sesetengah kursus dijalankan dengan komponen 100% teori atau 100% amali

Komponen Teori

Komponen teori terdiri dari sesi kuliah atau tutorial. Satu unit komponen teori adalah bersamaan dengan 1 jam kuliah/ bacaan seminggu atau 14 jam dalam 14 minggu pembelajaran bagi satu semester. Selain kuliah, tutorial juga diberikan semasa proses pembelajaran dan pengajaran dijalankan, dimana ia dilakukan dalam waktu makmal.

Komponen Amali

Komponen amali terdiri daripada sesi kerja amali. Satu unit komponen amali adalah bersamaan dengan 2 jam amali / tutorial seminggu atau 28 jam dalam 14 minggu pembelajaran bagi satu semester. Pelajar akan dinilai terhadap kerja amali, laporan kerja amali, perbentangan dan ujian amali semasa proses pengajaran dan pembelajaran dijalankan. Komponen amali terdiri daripada kaedah-kaedah pengajaran-pembelajaran berikut:

- Pembelajaran di dalam makmal - di mana sekumpulan pelajar (yang terdiri dari 2-4 orang) menjalankan sesuatu eksperimen. Di dalam beberapa makmal asas, setiap pelajar menjalankan sesuatu eksperimen secara individu (1:1) dan bukannya secara berkumpulan. Pelajar dikehendaki menulis laporan makmal mengikut modul makmal/ bengkel sebaik sahaja sesi makmal/ bengkel berakhir. Selain menduduki peperiksaan bertulis, pelajar juga akan diuji dengan mengadakan ujian makmal secara individu untuk memantapkan kebolehan teknikal mereka.

- Pembelajaran menggunakan teaching factory - Sekumpulan pelajar (yang terdiri dari 5-6 orang) menjalankan sesebuah ujilari (process run) dengan menggunakan peralatan skala sebenar yang terdapat di industri.

- Pembelajaran Elektronik (e-learning) - Pelajar belajar topik-topik yang dikenalpasti secara individu atau berkumpulan dengan bantuan komputer.

- Latihan Industri (InTra) - Latihan Industri dijalankan di luar kampus, iaitu di pelbagai sektor industri yang berkaitan dengan bidang pengkhususan pelajar selama satu semester.

- Projek Semestral - Pelajar melaksanakan satu projek teknikal secara individu atau berkumpulan.Sebagai tambahan, pelajar juga digalakkan untuk memikirkan bagaimana menukar hasil projek mereka kepada satu produk atau perkhidmatan yang boleh dikomersialkan. Ini merupakan komponen keusahawanan yang akan dinilai.

- Lawatan ke Industri - Pelajar melawat kilang kilang di industri melalui program yang disusun berdasarkan kursus ataupun berdasarkan program pengajian masing-masing.

Takrifan Kursus

Untuk program Diploma Kejuruteraan di UniMAP, terdapat dua jenis kursus sahaja, iaitu Kursus Teras dan Kursus Keperluan Universiti.

Kursus Teras

Kursus Teras terdiri daripada kursus-kursus Kejuruteraan yang wajib diambil oleh semua pelajar Diploma Kejuruteraan. Kursus-kursus ini menjadi keperluan utama untuk pengijazahan. Pelajar yang gagal mana-mana kursus Teras Kejuruteraan mesti mengulanginya dan lulus sebelum layak dipertimbangkan untuk pengijazahan

Kursus Keperluan Universiti

Kursus Keperluan Universiti ialah kursus-kursus di luar pengkhususan pelajar. Kursus-kursus ini ditawarkan oleh Pusat Pengajian Pembangunan Insan dan Teknokomunikasi (iKOM), Pusat Bahasa Antarabangsa dan Pusat Kokurikulum. Semua kursus ini wajib diambil dan pelajar perlu lulus dengan gred C sebagai syarat untuk pengijazahan. Kursus-kursus tersebut ialah:

Latihan Industri

Selain daripada menghadiri kuliah, tutorial dan amali, pelajar juga diwajibkan menjalani Latihan Industri. Latihan Industri merupakan kursus 6 unit. Pelajar wajib menjalani Latihan Industri selama 16 minggu sebelum layak dianugerahkan 6 kredit bagi kursus ini. Penilaian jam pertemuan (berbentuk jam bekerja di pusat/ organisasi terbabit) dilakukan dengan mengambilkira purata 8 jam pertemuan sehari selama 5 hari seminggu, iaitu 8 jam sehari X 5 hari = 40 jam seminggu.

Pelajar akan didedahkan kepada aspek teknikal dan aplikasi dan juga aspek-aspek lain seperti skruktur organisasi syarikat, operasi syarikaf, fungsi-fungsi jabatan, prosedur kerja, prosedur keselamatan, pengurusan, komunikasi, pengurusan projek don pembentangan. Pelajar juga perlu menghantar buku log don laporon akhir di penghujung lalihan Industri. Secara umumnya, kursus ini adalah berteraskan amali .

Kod Kursus

Setiap kursus yang ditawarkan mempunyai kod yang tersendiri. Untuk pengajian program Kejuruteraan, Teknologi Kejuruteraan, Perniagaan dan Komunikasi Media Baharu, kod bagi sesebuah kursus diringkaskan dalam Jadual 2(a), 2(b) dan 2(c) di bawah:

Jadual 2(a): Abjad Pertama;
Peringkat Pengajian/Jenis program yang ditawarkan di peringkat Diploma

Abjad Pertama di dalam Kod	Jenis Program
D	Diploma Kejuruteraan

Jadual 2(b): Abjad Kedua;
Program / Pusat Pengajian yang Menawarkan Kursus

HURUF KEDUA DALAM KOD	PROGRAM YANG MENAWARKAN KURSUS
E	Program Elektrik
M	Program Mikroelektronik
K	Program Komputer
N	Program Mekatronik
B	Program Metalurgi
P	Program Pembuatan
U	PP Pembangunan Insan Dan Teknokomunikasi
C	Pusat Kejuruteraan
Q	Institut Matematik Kejuruteraan
I	Pusat Kerjasama Industri Dan Agensi Kerajaan
V	Pusat Bahasa Antarabangsa
Z	Pusat Ko-kurikulum

Jadual 2(c): Abjad Ketiga;
Kursus Teras atau Kursus Keperluan Universiti;

Abjad ketiga dalam Kod	Jenis Kursus
T	Kursus Teras
W	Kursus Keperluan Universiti
A	Kursus Audit
M	Kursus Mobiliti

Tiga angka terakhir bagi sesebuah kod kursus mewakili perkara-perkara berikut iaitu angka pertama adalah tahap kursus, angka kedua dan ketiga adalah nombor kursus. Kod bagi sesebuah kursus diringkaskan dalam Jadual 3 dibawah

A	B	C	1	2	3	4	ANGKA	DESKRIPSI
↓	↓	↓	↓	↓	↓	→		
↓	↓	↓	↓	↓	↓	→	4	Unit/Kredit
↓	↓	↓	↓	↓	↳	→	3	Kelompok Kursus. (Penentuan kelompok kursus ditentukan oleh Pusat Pengajian masing-masing)
↓	↓	↓	↓	↳	→	→	2	
↓	↓	↓	↳	→	→	→	1	Aras/ Tahap Kursus program Sarjana Muda: • 1=subjek Tahun 1, • 2= subjek Tahun 2, • 3= subjek Tahun 3,
↓	↓	↳	→	→	→	→	JENIS KURSUS	Sila rujuk Jadual 3(c)
↓	↳	→	→	→	→	→	PUSAT PENGAJIAN	Sila rujuk Jadual 3(b)
↳	→	→	→	→	→	→	PERINGKAT PENGAJIAN	Sila rujuk Jadual 3(a)

PENDAFTARAN KURSUS

Semua pelajar yang aktif adalah diwajibkan mendaftar kursus untuk setiap semester. Pendaftaran kursus ini dilakukan secara dalam talian (online) oleh semua pelajar. Pendaftaran kursus mesti dibuat mengikut tarikh yang telah ditetapkan seperti hebahan yang dikeluarkan oleh Unit Kemasukan dan Rekod Pelajar melalui emel dan portal.

Pelajar adalah diwajibkan untuk bertemu dan berbincang dengan Rakan Pendamping Siswa (RPS) berkaitan kursus-kursus yang perlu didaftar. Pelajar perlu membawa bersama slip pendaftaran kursus untuk disahkan oleh RPS dalam sistem pada sesi tersebut. Kursus-kursus yang didaftarkan tanpa mendapat pengesahan dari RPS adalah dianggap tidak sah. Sekiranya berlaku perubahan pada pendaftaran kursus sama ada pelajar menambah, menggugur atau tarik diri kursus dalam tempoh yang ditetapkan, pelajar perlu mendapatkan pengesahan semula daripada RPS.

Pelajar yang gagal mendaftar kursus dalam tempoh masa yang ditetapkan adalah tertakluk kepada penalti berjumlah RM50. Pendaftaran lewat tidak boleh melebihi minggu ketiga (3) semester. Pelajar perlu mengisi Borang HEA(B)-02[b] (Borang Pendaftaran Kursus Lewat) dan mesti memperolehi kelulusan daripada Dekan Pusat Pengajian.

Manakala pelajar yang baru mendaftar bagi satu-satu sidang akademik baru akan mendaftar secara online pada tarikh yang dinyatakan pada Minggu Suaikenal mengikut Pusat Pengajian masing-masing. Pelajar akan diberi taklimat tentang kursus, dalam Minggu Suaikenal tersebut di Pusat Pengajian masing-masing.

Adalah menjadi tanggungjawab pelajar untuk menyemak dan memastikan bahawa semua butir-butir yang dinyatakan dalam Slip Pendaftaran Kursus adalah betul. Sebarang permohonan pendaftaran kursus/ penambahan kursus / pengguguran kursus / tarik diri di luar tempoh yang ditetapkan tanpa sebab-sebab yang boleh diterima oleh Universiti, boleh dikenakan denda kecuali pelajar yang mempunyai alasan yang tertentu sahaja akan dipertimbangkan oleh Dekan Pusat Pengajian. Pelajar tidak dibenarkan membuat pendaftaran kursus/ penambahan kursus/pengguguran kursus/tarik diri kursus semasa minggu peperiksaan.

Pelajar yang tidak mendaftar kursus maksimum 2 semester berturut-turut tanpa sebarang alasan boleh ditamatkan pengajian dengan menggunakan Borang HEA(B)-09 (Borang Penamatan Pengajian Pelajar).

Pelajar yang telah ditamatkan pengajian dan merayu untuk menyambung semula pengajian perlu menulis surat rayuan permohonan kemasukan kepada Naib Canselor melalui Dekan Pusat Pengajian (perakuan Dekan diperlukan). Penalti RM100 akan dikenakan kepada pelajar bagi setiap rayuan kemasukan semula yang diluluskan

1. Pendaftaran Kursus Pelajar Berstatus Aktif

   Pelajar berstatus Aktif boleh mendaftar kursus secara online tidak melebihi 22 unit dan tidak kurang daripada 10 unit kecuali pelajar yang mengikuti Latihan Industri dan pelajar Semester Akhir yang akan menamatkan pengajian. Pelajar yang ingin mendaftar melebihi 22 unit perlu mendapatkan kebenaran daripada RPS dengan kelulusan daripada Dekan Pusat Pengajian.

   Keterangan mengenai Pendaftaran Kursus pelajar berstatus Aktif diringkaskan seperti di Jadual 4 di bawah:

   Jadual 4: Ringkasan Pendaftaran Kursus Pelajar Berstatus Aktif

Status Pelajar	Unit Minimum	Unit Maksimum
Pelajar Aktif	10	22
Pelajar Aktif yang mengambil kursus Latihan Indutri (LI) atau Projek Tahun Akhir (FYP)	10	28

** Pelajar yang tidak mengambil kursus LI atau FYP boleh mengambil kursus melebihi 22 unit dengan kelulusan Dekan Pusat Pengajian terlebih dahulu.*

2. Pendaftaran Kursus Pelajar Percubaan [P]

Pelajar dengan status Percubaan tidak dibenarkan untuk mendaftar sendiri secara dalam talian (online). Pelajar ini perlu bertemu dengan RPS mereka untuk mendapatkan nasihat dan pengesahan daripada Dekan serta perlu juga mengisi Borang HEA(B)-02[a] (Borang Pendaftaran Kursus: Status Percubaan) sebelum menyerahkannya kepada Penolong Pendaftar Pusat Pengajian untuk didaftarkan. Hanya Penolong Pendaftar Pusat Pengajian atau Jabatan Pendaftar sahaja yang boleh mendaftarkan kursus bagi pelajar ini. Jumlah unit yang dibenarkan untuk Pelajar Percubaan adalah seperti Jadual 5 berikut:

Jadual 5: Ringkasan Pendaftaran Kursus Pelajar Percubaan [P]

Status Pelajar	Unit Minimum	Unit Maksimum
Percubaan (P1)	8	12
Percubaan (P2)	8	10

PENAMBAHAN / PENGGUGURAN/ TARIK DIRI KURSUS

1. Tambah Kursus

a) Tempoh yang dibenarkan untuk penambahan kursus adalah sehingga minggu ke-2 minggu pembelajaran
b) Pelajar perlu mengisi Borang HEA(B)-02[b] (Borang Pendaftaran Kursus Lewat) dan menyerahkannya kepada Penolong Pendaftar Pusat Pengajian untuk dikemaskini dalam sistem

2. Gugur Kursus

a) Tempoh yang dibenarkan untuk menggugurkan kursus adalah sehingga minggu ke-6 minggu pembelajaran.
b) Pelajar perlu mengisi Borang HEA(B)-03 (Borang Permohonan Gugur Kursus). Borang perlu ditandatangani oleh pensyarah kursus, Dekan Pusat Pengajian dan diserahkan kepada Penolong Pendaftar Pusat Pengajian untuk dikemaskini dalam sistem.

3. Tarik Diri Kursus (TD)

a) Pelajar dengan persetujuan Pensyarah Kursus dan Dekan Pusat Pengajian boleh memohon untuk menarik diri daripada kursus yang telah didaftarkan pada semester yang berkenaan tidak lewat dari hari akhir bekerja pada minggu ke-12 minggu pembelajaran. Pelajar yang ingin menarik diri daripada kursus perlulah mengisi Borang HEA(B)-04 (Borang Permohonan Tarik Diri Kursus).
b) Kebenaran untuk pelajar menarik diri daripada mengikuti sesuatu kursus adalah tertakluk kepada jumlah unit minimum, kecuali dengan kebenaran Dekan.
c) Status Tarik Diri (TD) akan dicatatkan dalam rekod pendaftaran kursus dan transkrip akademik pelajar. Walau bagaimanapun, gred tidak akan diambil kira dalam pengiraan PNG dan PNGK.

PERTUKARAN PROGRAM PENGAJIAN

Pertukaran program pengajian bermaksud pelajar menukar program pengajiannya kepada sesuatu program pengajian yang lain atas sebab-sebab tertentu yang dipersetujui oleh kedua-dua Dekan sekarang dan Dekan Pusat Pengajian yang dipohon.

Pertukaran program pengajian tidak dibenarkan kerana ia melibatkan penukaran agihan sumber yang sudah dirancang dengan rapi pada awal sesuatu sidang akademik. Walau bagaimanapun, permohonan rayuan pertukaran program pengajian boleh dipertimbangkan dengan alasan-alasan yang kukuh sahaja dan tertakluk kepada syarat-syarat seperti berikut:

1. Permohonan hanya boleh dibuat oleh pelajar setelah tamat sekurang-kurangnya satu semester pengajian. Pelajar perlu mengisi Borang HEA(B)-06 (Permohonan Pertukaran Program Pengajian) dengan lengkap. Borang permohonan boleh didapati di Jabatan Pendaftar atau di Pusat Pengajian. Walau bagaimanapun, bagi kes-kes tertentu, permohonan pelajar untuk pertukaran program pengajian pada permulaan pengajian boleh dipertimbangkan dengan kelulusan Naib Canselor/Timbalan Naib Canselor (Akademik & Antarabangsa).

2. Permohonan pertukaran program pengajian mestilah tidak melewati dua (2) semester pertama pengajian di UniMAP. Borang permohonan mestilah disertakan dengan salinan keputusan peperiksaan semester yang terkini atau keputusan pada peringkat Matrikulasi/STPM/Diploma.

3. Pelajar hanya boleh memohon bertukar program pengajian tidak melewati 2 semester pertama pengajian di UniMAP. Permohonan setelah masuk semester ketiga pengajian tidak akan dipertimbangkan.

4. Setiap permohonan perlu disertakan dengan sebab-sebab pertukaran program pengajian yang kukuh secara bertulis. Permohonan perlu mendapat perakuan dan kelulusan Rakan Pendamping Siswa (RPS) (program asal dan program dipohon), Dekan Pusat Pengajian (program asal dan program dipohon), Dekan Pengurusan Akademik dan Naib Canselor/Timbalan Naib Canselor (Akademik & Antarabangsa).

5. Bagi pelajar yang mendapat biasiswa/PTPTN atau sebagainya, pelajar mestilah mendapat kelulusan dari penaja masing-masing. Pelajar perlu berurusan secara terus dengan pihak penaja. Penerangan boleh diperolehi daripada Jabatan Hal Ehwal Pelajar dan Alumni.

6. Sekiranya permohonan diluluskan, pelajar perlu mengambil tindakan untuk mendaftar kursus-kursus baru yang ditawarkan dalam program pengajian baru tersebut.

7. Pelajar yang bertukar program pengajian dalam bidang yang sama boleh memohon pemindahan kredit bagi kursus teras dan kursus wajib universiti atau kursus yang sama dalam kurikulum program pengajian baru. Walau bagaimanapun, semua kursus lain yang tidak berkaitan dengan kurikulum program pengajian baru akan kekal dalam transkrip akademik tetapi tidak akan diambil kira dalam pengiraan PNG/PNGK dan kredit.

8. Pelajar yang bertukar program pengajian dalam bidang yang berlainan hanya boleh memohon pemindahan kredit bagi kursus wajib universiti sahaja atau kursus yang sama dalam kurikulum program pengajian baru. Walau bagaimanapun, semua kursus lain yang tidak berkaitan dengan kurikulum program pengajian baru akan kekal dalam transkrip akademik tetapi kredit tidak akan diambil kira dalam pengiraan PNG/PNGK.

PENANGGUHAN PENGAJIAN

Penangguhan pengajian adalah kebenaran kepada pelajar untuk tidak mengikuti pengajian pada sesuatu semester atas alasan-alasan tertentu yang dibenarkan Universiti.

Permohonan penangguhan pengajian dibenarkan kepada pelajar yang mempunyai masalah kesihatan dan disahkan sakit oleh Hospital Kerajaan/Doktor Panel Universiti / Pusat Kesihatan UniMAP sahaja. Bagi kes-kes tertentu sijil sakit yang bukan daripada Hospital Kerajaan atau Doktor Panel Universiti perlu mendapat perakuan Pusat Kesihatan UniMAP. Permohonan yang diasaskan selain daripada masalah kesihatan boleh dipertimbangkan sekiranya mempunyai alasan yang munasabah dan mendapat kelulusan Naib Canselor/Timbalan Naib Canselor (Akademik & Antarabangsa).

Pelajar yang memohon untuk menangguhkan pengajian perlu mengisi Borang HEA(B)-07 (Borang Permohonan Tangguh Pengajian) yang boleh didapati di Pusat Pengajian. Permohonan perlu mendapat perakuan dan kelulusan yang berikut:

1. Perakuan Rakan Pendamping Siswa (RPS),
2. Perakuan Dekan Pusat Pengajian,
3. Perakuan Dekan Jabatan Hal Ehwal Pelajar & Alumni,
4. Perakuan Kaunselor (jika perlu)
5. Perakuan Dekan Pengurusan Akademik, dan
6. Kelulusan Naib Canselor atau Timbalan Naib Canselor (Akademik & Antarabangsa)

Borang pemohonan penangguhan pengajian pelajar perlu dikemukakan sebelum minggu ketujuh (7) pengajian. Pemohonan selepas minggu ketujuh (7) hanya dibenarkan atas sebab kesihatan atau kes-kes tertentu yang mendapat kelulusan Naib Canselor/Timbalan Naib Canselor (Akademik & Antarabangsa).

Pelajar tidak dibenarkan menangguhkan pengajian melebihi 2 semester berturut-turut kecuali dengan kelulusan Naib Canselor/ Timbalan Naib Canselor (Akademik & Antarabangsa). Bagi kes selain sebab kesihatan, pelajar hanya dibenarkan pulang/keluar daripada universiti setelah permohonan penangguhan pengajian mendapat kelulusan universiti. Sekiranya pelajar telah pulang sebelum kelulusan diperoleh, ia adalah di bawah tanggungjawab pelajar sendiri.

Bagi pelajar yang menangguhkan pengajian atas sebab kesihatan/ sakit atau untuk alasan-alasan yang dibenarkan, semester berkenaan tidak akan diambil kira dalam pengiraan semester yang digunakan untuk pengijazahan (Tanpa Penalti). Bagi kes Tanpa Penalti, kursus yang didaftarkan pada semester tersebut akan digugurkan, dan sekiranya terdapat keputusan peperiksaan yang telah disahkan pada peringkat Majlis Peperiksaan Universiti (MPU), keputusan peperiksaan tersebut juga akan terbatal.

Pelajar yang menangguhkan pengajian atas sebab selain daripada sebab kesihatan, semester berkenaan akan diambil kira dalam pengiraan semester yang digunakan untuk pengijazahan (Dengan Penalti) kecuali dengan kebenaran Naib Canselor/Timbalan Naib Canselor (Akademik & Antarabangsa). Bagi kes Dengan Penalti, kursus yang didaftarkan pada semester tersebut tidak akan digugurkan dan akan diambil kira dalam semester. Sebarang keputusan peperiksaan yang telah disahkan pada peringkat MPU juga tidak terbatal dan akan tertera dalam transkrip akademik pelajar.

Pelajar akan diberikan amaran secara bertulis oleh Pusat Pengajian sekiranya didapati tidak mendaftar pada sesuatu semester tanpa memberi sebarang permohonan penangguhan pengajian. Pelajar yang tidak memberi sebarang maklum balas dalam sesuatu tempoh yang diberikan boleh dikeluarkan dari senarai nama pelajar berdaftar Universiti/ditamatkan dan disahkan berhenti dari Universiti.

PENARAFAN PELAJAR

Taraf akademik pelajar diukur dengan sistem Purata Nilai Gred (PNG) sepanjang pengajian di universiti. Seseorang pelajar yang berjaya mendapat sekurang-kurangnya 2.00 bagi PNG pada satu-satu semester diberi taraf 'Aktif' (A) dan boleh meneruskan pengajian dalam semester yang berikutnya. Pelajar juga dikehendaki mendapatkan Purata Nilai Gred Kumulatif (PNGK) sekurang-kurangnya 2.00 untuk berijazah.
Bagi pelajar tahun akhir yang dibenarkan mengambil Kursus Kuratif, keputusan peperiksaan Kursus-kursus Kuratif akan dicantumkan dengan keputusan peperiksaan Semester 2 sidang berkenaan untuk menentukan markah PNG dan taraf akademik pelajar. Jika purata gabungan adalah lebih baik, maka pelajar akan diberi taraf terbaharunya tetapi jika purata gabungan adalah kurang baik, maka taraf Semester 2 dikekalkan.

Pelajar dengan PNG kurang daripada 2.00 pada satu-satu semester akan di beri taraf PERCUBAAN 1 (P1). Taraf PERCUBAAN 2 (P2) pula diberikan kepada pelajar yang mendapat PNG kurang daripada 2.00 bagi dua semester berturut-turut. Jika pelajar masih mendapat kurang dari 2.00 bagi PNG semester berikutnya pula, pelajar berkenaan tidak dibenarkan meneruskan pengajian, melainkan PNGK pelajar tersebut melebihi 2.00 dan pihak universiti memperakukannya. Pihak universiti berkuasa menamatkan pengajian mana-mana pelajar yang didapati tidak memenuhi prestasi dan kemajuan akademik yang ditetapkan.

TEMPOH MINIMUM / MAKSIMUM PENGAJIAN PELAJAR

Pelajar perlu menamatkan program pengajian dalam tempoh masa yang telah ditetapkan, iaitu minimum 3 tahun (6 semester) dan tempoh maksimum 5 tahun(10 semester).

SEMESTER TAMBAHAN

Semester Tambahan adalah satu semester pendek yang diadakan dalam masa cuti akhir tahun akademik. Semester Tambahan menawarkan kursus-kursus tertentu sahaja untuk kursus Keperluan Universiti, Teras dan Elektif kepada pelajar setiap tahun pengajian. Tempoh Semester Tambahan merangkumi empat(4) minggu pembelajaran dan satu(1) minggu peperiksaan sahaja. Cuti pertengahan semester dan ulangkaji tidak diperuntukkan untuk semester ini.

Pelajar wajib mendaftarkan kursus dan pendaftaran hendaklah tidak melebihi 9 unit per semester dan terhad kepada 16 unit berdaftar untuk keseluruhan tahun pengajian. Pembelajaran dan pengajaran adalah dalam bentuk tutorial selama 4 minggu dan kehadiran pelajar dalam tutorial yang dikendalikan juga diwajibkan dan kedatangan adalah direkodkan.

Syarat-syarat kelayakan mengikuti Semester Tambahan adalah:

1. Kursus yang ditawarkan dalam Semester Tambahan layak dimohon oleh pelajar yang mendapat
   i. Gred C-/ D+/D/ D-/ F dan DK untuk Kursus Keperluan Universiti;
   ATAU
   ii. Gred C-/ D+/D/ D-/ F dan DK untuk Kursus Teras dan Elektif Universiti.
   DAN
   iii. Lulus kerja kursus bagi kursus-kursus yang berkaitan
2. Pelajar boleh mengulang kursus yang berkaitan setiap kali ianya ditawarkan sama ada dalam semester lazim atau semester tambahan sidang berikutnya.
3. Pelajar yang mendapat gred F* dan X tidak layak untuk mendaftar semester tambahan.

Pelajar wajib mendaftar kursus semester tambahan dengan syarat :

1. Pelajar telah membayar yuran tertunggak.
2. Pelajar menjelaskan yuran semester tambahan selewat-lewatnya pada minggu ke-2 kuliah dalam Semester Tambahan (sebelum keputusan peperiksaaan semester ke-2 dikeluarkan).

SISTEM PEPERIKSAAN DAN PENILAIAN

Peperiksaan bertulis diadakan pada hujung semester. Setiap pelajar mestilah terlebih dahulu memenuhi syarat-syarat kuliah, tutorial, amali dan sebagainya sebelum layak menduduki peperiksaan. Tempoh peperiksaan adalah seperti berikut :

Jadual 6: Tempoh Peperiksaan

Nilai Kursus	Nilai Kursus
1 unit	1 unit
2 – 4 unit	2 – 4 unit

Keputusan peperiksaan pelajar ditentukan berdasarkan penilaian secara berterusan dari komponen kerja kursus dan peperiksaan bertulis. Sumbangan kerja kursus adalah 100% jika sesebuah kursus itu keseluruhannya berbentuk makmal. Kerja kursus biasanya merangkumi tugasan, laporan makmal dan ujian. Penilaian prestasi pelajar adalah berdasarkan kepada gred abjad dan mata penilaian seperti berikut:

Jadual 7: Gred Abjad dan Mata Penilaian

GRED	MATA NILAI	STATUS
A	4.00	LULUS
A-	3.75	
B+	3.50	
B	3.00	
B-	2.75	
C+	2.50	
C	2.00	
C-	1.75	TIDAK LULUS
D+	1.50	
D	1.00	
D-	0.75	
F	0.00	

Gred LULUS untuk sesuatu kursus adalah tertakluk kepada keperluan kursus seperti yang berikut:-

1. Gred LULUS untuk semua kursus ialah Gred C dan ke atas
2. Gred TIDAK LULUS adalah Gred C- hingga Gred F
3. Sekiranya pelajar memperolehi PNGK (CGPA) > 2.00 dan mendapat Gred C- atau Gred D+ untuk Kursus Teras, ianya adalah dikira sebagai LULUS.

Jadual 8: Pengiraan GPA dan CGPA:

KURSUS	UNIT	NILAI GRED [NG]	GRED [G]	JUMLAH NG
DBT101	3	3.75	A-	11.25
DET101	3	2.50	C+	7.50
DMT111	2	3.50	B+	7.00
DNT111	2	4.00	A	8.00
DQT101	3	1.75	C-	5.25
DUT102	2	2.75	B-	5.50
	15			44.50
PNG = 44.50/15 = 2.96				
DET102	3	3.50	B+	10.50
DKT121	3	2.00	C	6.00
DKT122	3	4.00	A	12.00
DNT123	2	3.50	B+	7.00
DQT102	3	3.75	A-	11.25
	14			46.75
PNG = 46.75/14 = 3.33				

PNGK = Jumlah NG Terkumpul / Jumlah Bil. Unit Terkumpul

= 44.50 + 46.75 / 5 + 14

= 3.15

RAYUAN PENYEMAKAN SEMULA KEPUTUSAN PEPERIKSAAN

Atas sebab-sebab tertentu, pelajar mungkin ingin memohon untuk penyemakan dijalankan ke atas keputusan peperiksaan akhir semester pelajar. Pelajar hanya dibenarkan memohon menyemak semula keputusan peperiksaan akhir semester dalam tempoh 15 hari selepas keputusan rasmi peperiksaan dikeluarkan oleh Jabatan Pendaftar. Permohonan selepas tempoh ini tidak akan dipertimbangkan.

Pelajar perlu menghantar Borang HEA-15m [Borang Rayuan Penyemakan Semula Keputusan Peperiksaan] kepada Unit Peperiksaan & Pengijazahan, Bahagian Pengurusan Akademik, Jabatan Pendaftar. Borang rayuan hendaklah dikemukakan dalam tempoh 15 hari selepas keputusan rasmi diumumkan. Pelajar perlu mengisi borang dalam dua (2) salinan. Satu (1) salinan adalah untuk simpanan pelajar.

Kadar bayaran rayuan ialah RM50 untuk setiap kursus. Pembayaran secara tunai atau Wang Pos/Pos Malaysia / Draf Bank / Cek atas nama BENDAHARI UNIMAP.

PENGGUNAAN BAHASA INGGERIS

Bahasa Melayu adalah bahasa rasmi universiti. Walau bagaimanapun Bahasa Inggeris digunakan secara meluas dalam proses pengajaran dan pembelajaran. Ini adalah untuk membantu pelajar dalam kerjaya mereka. Bagi kursus-kursus yang diajar dalam bahasa Inggeris, peperiksaan akan dijalankan dalam bahasa yang sama.

SISTEM RAKAN PENDAMPING SISWA (RPS)

Sistem Penasihatan Akademik menjadi penghubung antara pelajar dengan pensyarah untuk berbincang dan membuat keputusan berkenaan rancangan pengajian pelajar. Walaupun pelajar mendaftar sendiri secara dalam talian (on-line), pelajar perlu berjumpa dengan Rakan Pendamping Siswa (RPS) untuk mendapatkan nasihat semasa tempoh pendaftaran.

RPS adalah satu sistem di mana staf akademik menyelia sekumpulan kecil pelajar sepanjang tempoh pengajian pelajar di UniMAP. 'Penyeliaan' di sini melibatkan perjumpaan yang kerap secara tidak formal, di mana pelajar boleh bersantai dengan staf yang berperanan sebagai "'rakan" bagi membincangkan isu-isu akademik dan sosial yang berkenaan dengan mereka. Pelajar yang mempunyai prestasi akademik yang tidak memuaskan boleh merujuk kepada RPS sebagai 'mentor', dan pelajar tersebut menjadi 'mentee', di mana ini akan benar-benar membantu pelajar dalam setiap perkara yang memerlukan penyelesaian.

14.0 PUSAT-PUSAT PEMANTAPAN AKADEMIK

PUSAT-PUSAT PEMANTAPAN AKADEMIK

Pusat-pusat ini ditubuhkan untuk menyokong pencapaian akademik pelajar UniMAP:

1. PUSAT PENGAJIAN PEMBANGUNAN INSAN DAN TEKNOKOMUNIKASI (IKOM)

   Pusat Pengajian Pembangunan Insan dan Teknokomunikasi (iKOM) menawarkan kursus-kursus Keperluan Universiti dan pelbagai kursus yang menyalurkan pengetahuan sosial dan kemanusiaan yang berkaitan dengan semua bidang pengajian di UniMAP. Selain itu iKOM berperanan untuk meningkatkan kemahiran generik pelajar dan kemahiran insaniah (soft skills) yang merangkumi komunikasi, bahasa, ICT dan sosio-kemanusiaan dalam menghadapi cabaran dinamik dunia global.

2. PUSAT KEJURUTERAAN

   Pusat Kejuruteraan ditubuhkan bagi mengendalikan makmal dan bengkel umum (gunasama) yang diperlukan oleh pelbagai program yang ditawarkan di UniMAP.

   Pusat ini juga menyokong aktiviti penyelidikan dan pembangunan di UniMAP serta menjadi pusat mereka bentuk dan menghasilkan produk-produk kejuruteraan yang inovatif. Pusat Kejuruteraan juga menawarkan kemudahan bagi kursus-kursus yang memerlukan latihan dan kemahiran teknikal, selari dengan standard industri.

3. INSTITUT MATEMATIK KEJURUTERAAN

   Institut Matematik Kejuruteraan (IMK) adalah pusat yang merancang dan mengendalikan kurikulum Matematik Kejuruteraan di UniMAP. Ia berperanan sebagai pusat rujukan dalam menyediakan kepakaran dalam kaedah penyelidikan matematik, simulasi dan kaedah statistik. Pusat ini juga berfungsi sebagai pusat latihan dalam kampus dan personel luar kampus dalam bidang yang berkaitan dengan matematik.

4. PUSAT BAHASA ANTARABANGSA

   Pusat Bahasa Antarabangsa menyediakan kursus-kursus bahasa Keperluan Universiti untuk semua pelajar UniMAP bagi program pengajian peringkat Diploma dan Ijazah Sarjana Muda. Pusat ini menawarkan bukan sahaja kursus Bahasa Melayu dan kursus Bahasa Inggeris tetapi juga menawarkan kursus-kursus bahasa asing lain seperti Bahasa Arab, Bahasa Jerman, Bahasa Jepun, Bahasa Mandarin, Bahasa Korea, Bahasa Rusia dan Bahasa Thai.

5. PUSAT KO-KURIKULUM

   Pusat Ko-kurikulum menawarkan pelbagai kursus Ko-kurikulum dan Badan-badan Beruniform. Semua pelajar wajib untuk mengambil 2 unit kursus Ko-kurikulum. Pusat ini menawarkan 147 jenis kursus untuk pelajar tanpa mengira program akademik mereka.

6. PUSAT KERJASAMA INDUSTRI DAN AGENSI KERAJAAN

   Pusat Kerjasama Industri dan Agensi Kerajaan (CIGC) berperanan menjalin hubungan dengan pihak industri dan agensi kerajaan dalam pelbagai aspek, terutama dalam program yang berkaitan terus dengan pembelajaran pelajar. Program seperti pendedahan kepada industri, forum bersama industri dan Latihan Perindustrian Staf, diselia dan diselaraskan oleh pusat ini. Sesetengah daripada program ini wajib diambil oleh semua pelajar.

15.0 BAHAGIAN PENGURUSAN AKADEMIK, JABATAN PENDAFTAR

BAHAGIAN PENGURUSAN AKADEMIK, JABATAN PENDAFTAR

Bahagian Pengurusan Akademik ini bertanggungjawab untuk mengendalikan urusan-urusan yang berkaitan kemasukan pelajar, pemprosesan data dan rekod pelajar, peperiksaan dan pengijazahan pelajar dan Senat Universiti.

Unit-unit yang terdapat di Bahagian Pengurusan Akademik, Jabatan Pendaftar terbahagi kepada:

1. UNIT KEMASUKAN DAN REKOD PELAJAR

   Unit Kemasukan dan Rekod Pelajar bertanggungjawab untuk mengendalikan urusan yang berkaitan dengan kemasukan pelajar dan pemprosesan data dan rekod pelajar. Antara tugas dan tanggungjawab unit ini adalah:

   i. Mengendalikan secara keseluruhan proses pengambilan dan pendaftaran pelajar dalam negara pada peringkat ijazah pertama dan diploma.
   ii. Mengendalikan proses pengambilan dan pendaftaran pelajar antarabangsa pada peringkat ijazah pertama.
   iii. Mengurus dan mengendalikan aspek pemprosesan data dalam Sistem Maklumat Pelajar.
   iv. Menguruskan rekod peribadi pelajar dan status pelajar termasuk permohonan penangguhan pengajian dan pertukaran program pengajian pelajar.
   v. Menguruskan pendaftaran kursus pelajar secara online bagi setiap semester pengajian.
   vi. Menguruskan proses pengecualian unit dan pemindahan kredit pelajar.

2. UNIT PEPERIKSAAN DAN PENGIJAZAHAN

   Unit Peperiksaan dan Pengijazahan bertanggungjawab untuk mengendalikan dan memantau perjalanan Peperiksaan Akhir Semester dan perkara-perkara yang berkaitan dengannya. Antara tugas dan tanggungjawab unit ini adalah seperti berikut:

   i. Mengeluarkan Pekeliling Peperiksaan kepada Pusat Pengajian/ Pusat/Institut.
   ii. Mengeluarkan Jadual Waktu Peperiksaan untuk Program Diploma dan Ijazah.
   iii. Menguruskan Peperiksaan Akhir Semester dalam jangkamasa yang ditetapkan.
   iv. Menjadi Sekretariat kepada Majlis Peperiksaan Universiti.
   v. Menguruskan pemprosesan data peperiksaan mengunakan Sistem Maklumat Pelajar.
   vi. Mengeluarkan keputusan peperiksaan akhir semester.
   vii. Menguruskan proses rayuan pelajar untuk menyemak semula keputusan peperiksaan.
   viii. Mengeluarkan Transkrip Akademik selepas Konvokesyen.

Bagi fungsi pengijazahan, unit ini mengendalikan urusan pengijzahan dan konvokesyen pelajar. Antara bidang tugas unit ini adalah seperti berikut:

i. Menyemak kelayakan pengijazahan untuk pelajar tahun akhir serta mengeluarkan surat penamatan pengajian dan kelayakan pengijazahan untuk pelajar yang layak bergraduat.
ii. Sekretariat konvokesyen universiti
iii. Menyelaraskan jemputan serta pinjaman dan pemulangan pakaian konvokesyen
iv. Mengendalikan urusan peminjaman dn pemulangan jubah staf akademik
v. Menguruskan proses penyediaan dan penyerahan skrol pengijazahan kepada graduan.
vi. Merekod dan mengemaskini data siswazah.

3. UNIT SENAT

   Unit Senat bertanggungjawab untuk mengendalikan urusan yang berkaitan dengan Senat Universiti. Antara tugas dan tanggungjawab yang dijalankan adalah:

   i. Merancang aktiviti Senat dan Jawatankuasa di bawahnya, untuk memberi khidmat Urusetia dan menyelaraskannya dengan pihak-pihak lain yang berkaitan, dalam penawaran program-program sedia ada dan baru.
   ii. Menyediakan Kalendar Akademik, menguruskan senarai penawaran kursus serta berurusan dengan Kementerian Pendidikan Malaysia (KPM) dan Jabatan Perkhidmatan Awam (JPA) mengenai penawaran program baru, penubuhan pusat pengajian/Jabatan dan Unit.
   iii. Menguruskan pencalonan penerima Ijazah Kehormat

Alamat:

Bahagian Pengurusan Akademik
Jabatan Pendaftar
Universiti Malaysia Perlis
Tingkat 3, Bangunan KWSP
Jalan Bukit Lagi
01000 Kangar
PERLIS.

DIREKTORI

- Bahagian Pengurusan Akademik
  Pejabat Timb. Naib Canselor (Akademik & Antarabangsa)
  04-979 8026

- Bahagian Pengurusan Akademik, Jabatan Pendaftar

  i. Unit Kemasukan dan Rekod Pelajar
     04-979 8706/7941
  ii. Unit Peperiksaan dan Pengijazahan
     04-9798708/8707
  iii. Unit SENAT
     04-9797940

- Pusat Hal Ehwal Antarabangsa
  04-988 5340

- Jabatan Hal Ehwal Pelajar & Alumni (HEPA)
  04-987 1300

- Jabatan Bendahari
  04-979 8203

PROGRAM KEJURUTERAAN

METALURGI

PROGRAM DIPLOMA KEJURUTERAAN METALURGI

Kursus-kursus yang ditawarkan melalui Program Diploma Metalurgi menyatukan teori dengan amali mengikut keperluan industri. Semasa mengikuti program akademik, pelajar juga akan dibekalkan dengan kemahiran komunikasi & IT, budaya perkembangan etnik, dan keusahawan kejuruteraan. Ini bertujuan untuk melahirkan graduan diploma yang bukan sahaja cekap dalam bidang kejuruteraan yang mereka ikuti, tetapi juga berkebolehan untuk mempunyai sikap yang mulia dan terpuji. Melalui program Diploma Kejuruteraan Metalurgi ini, para pelajar akan didedahkan dengan asas-asas bidang metalurgi terutamanya di dalam pemprosesan logam seperti pengenalan kepada logam-logam, pengekstrakan logam, penggelekan dan penyemperitan logam, peleburan dan penuangan logam, proses rawatan haba dan perlindungan logam.

Di samping itu para pelajar akan mempelajari dan mengendali asas-asas kerja-kerja permesinan logam di bengkel antaranya adalah pelarikan logam, pengisaran logam, pemotongan logam dan pencanaian logam. Para pelajar juga akan didedahkan dengan penggunaan serta pengendalian peralatanperalatan untuk pengujian sifat-sifat dan kelakuan logam seperti Universal Testing Machine (UTM), Mikroskop imbasan Elektron (SEM), Pembelauan Sinar-X (XRD) dan Ujian Tak Musnah (NDT) di samping pengujian kekerasan seperti Brinell, Rockwell, Izod dan Charpy. Selain itu, pelajar juga akan mempelajari dan mempraktikkan pelbagai jenis kimpalan logam seperti kimpalan arka, gas, rintangan, bintik, TIG dan MIG yang biasa digunakan di dalam industri.

Secara keseluruhannya, para pelajar yang mengikuti program ini bukan sahaja memperolehi pendedahan dan pengetahuan dalam bidang Kejuruteraan Metalurgi malahan dibekalkan dengan kemahiran-kemahiran yang diperlukan oleh pihak industri.

Senarai kursus yang ditawarkan dalam program Diploma Kejuruteraan (Kejuruteraan Metalurgi):

- DKA104 /2 Matematik Awalan (Preliminary Mathematics)
- DBT101/3 Pengenalan kepada Bahan Kejuruteraan (Introduction to Engineering Materials)
- DBT102/3 Logam Ferus (Ferrous Metal)
- DBT107/3 Asas Statik dan Dinamik (Basic Static and Dynamic)
- DBT108/2 Asas Bengkel Logam (Basic Metal Workshop)
- DBT109/3 Termodinamik Kimia (Chemical Thermodynamics)
- DBT110/3 Sains Kejuruteraan (Engineering Science)
- DBT111/2 Lukisan Kejuruteraan dan Lukisan Terbantu Komputer (Engineering Drawing and Computer Aided Drafting)
- DBT202/3 Logam Bukan Ferus (Non Ferrous Metal)
- DBT203/3 Teknologi Pengekstrakan Logam (Metal Extractive Technology)
- DBT204/3 Teknologi Kimpalan Logam 1 (Technology of Metal Welding 1)
- DBT206/3 Teknologi Foundri (Foundry Technology)
- DBT208/3 Teknologi Kimpalan Logam 2 (Technology of Metal Welding 2)
- DBT209/3 Pengujian Logam (Metal Testing)
- DBT210/3 Kekuatan Bahan (Strength of Materials)
- DBT211/3 Asas Pemesinan Logam (Basic Machining of Metals)
- DBT301/3 Metalurgi Serbuk (Powder Metallurgy)
- DBT302/3 Rawatan Haba (Heat Treatment)
- DBT303/3 Perlindungan Logam (Metals Protection)
- DBT304/3 Keselamatan Pekerjaan dan Pengurusan Kualiti (Occupational Safety and Quality Management)
- DBT351/3 Projek Semestral (Semestral Project)
- DIT361/6 Latihan Industri (Industrial Training)

Antara peluang kerjaya yang berkaitan :

- Pembantu Jurutera Proses
- Pembantu JuruteraPengeluaran
- Pembantu Jurutera Pembuatan Kawalan Mutu (QC)
- Pembantu Jurutera Jaminan Mutu (QA)
- Pembantu Jurutera Analisa Kegagalan
- Pembantu Jurutera Pembangunan Produk
- Pembantu JuruteraPembangunan Proses
- Pembantu Jurutera Pembangunan Bahan
- Pembantu Metalurgist
- Pembantu Penyelidik
- Pembantu Teknik
- Menjalankan perniagaan sendiri.

PROGRAM DIPLOMA KEJURUTERAAN METALURGI

TAHUN	PERTAMA		KEDUA		KETIGA	
SEMESTER	I	II	III	IV	V	VI
Kursus Teras Kejuruteraan (81)	DKA104/2 Matema tik Awalan	DQT101/3 Matematik I	DQT102/3 Matematik II	DQT203/3 Matematik III	DBT351/3 Projek Semetral	DIT361/6 Latihan Industri
	DBT110/3 Sains Kejuruteraan	DBT102/3 Logam Ferus	DET211/3 Asas Teknologi Elektrik	DBT206/3 Teknologi Foundri	DBT301/3 Metalurgi Serbuk	
	DBT101/3 Pengenalan kepada Bahan Kejuruteraan	DBT107/3 Asas Statik dan Dinamik	DBT202/3 Logam Bukan Ferus	DBT208/3 Teknologi Kimpalan Logam 2	DBT302/3 Rawatan Haba	
	DKT121/3 Asas Pengaturcar aan Komputer	DBT109/3 Termodinamik Kimia	DBT203/3 Teknologi Pengekstrakan Logam	DBT209/3 Pengujian Logam	DBT303/3 Perlindungan Logam	
	DBT108/2 Asas Bengkel Logam	DUT123/2 IT dan Kemah iran Komunikasi	DBT204/3 Teknologi Kimpalan Logam 1	DBT210/3 Kekuatan Bahan	DBT304/3 Keselamatan Pekerjaan dan Pengurusan Kualiti	
	DBT111/2 Lukisan Kejuruteraan dan Lukisan Terbantu Komputer			DBT211/3 Asas Pemesinan Logam		
81	13	14	15	18	15	6
Kursus Kepefluan Universiti (14)	DWW101/2 Bahasa Inggeris Komunikasi 1	DWW201/2 Bahasa Inggeris Komunikasi 2	DWW301/2 Bahasa Inggeris Komunikasi 3	DWW410/2 Bahasa Melayu	DUW224/2 Keusahawa nan Kejuruteraan	
	DZWXXX/1 Badan Beruniform 1	DZWXXX/1 Badan Beruniform 2	DUW239/2 Pengajian Malaysia II			
14	3	3	4	2	2	
95	16	17	19	20	17	6

Nota :
DKA104/2 Matematik Awalan : Prasyarat untuk Matematik Tambahan peringkat SPM dengan gred D

DETAILED SYLLABUS FOR METALURGY ENGINEERING

DKA104 PRELIMINARY MATHEMATICS

Synopsis

Mathematics is a required course of study in engineering programs diploma. This is due to the importance of mathematics as a tool in solving problems. This course is offered to master some basics mathematical knowledge and as a preparation for advance mathematics subjects which involve application in engineering.

Course Outcome

CO1:
Ability to express the concepts of trigonometry.
CO2:
Ability to express relevant concepts and methods in algebra.
CO3:
Ability to relate and apply the concepts and methods in calculus.
CO4:
Ability to apply the concepts of statistics and probability.

References

1. Stroud, K. A. "Engineering Mathematics", 7th. Ed. Palgrave MacMillan, 2013

DBT101 INTRODUCTION TO ENGINEERING MATERIALS

Synopsis

To introduce basic concepts in the field of engineering materials: Introduction to engineering materials such as metal, ceramic, polymer and composite. Students will be exposed to the structure, properties and application of each material group.

Course Outcome

CO1:
Able to describe types of material that suitable for engineering application
CO2:
Able to formulate crystalline and non-crystalline material structures, Miller index, lattice coordinate, direction and plane in unit cell.
CO3:
Able to interpret and categorize classes, properties and applications of metals, polymers, ceramics, composites, glasses, and advance materials.

References

1. Higgins R.A., Materials for Engineers and Technicians, 4th Edition. (2008)
2. Budinski, K.G & Budinski, M.K., Engineering Materials, Properties and Selection, Prentice Hall International, Inc., 1999.
3. Smith, W.F., Principles of Materials Science and Engineering, McGraw Hill, 1990.
4. John, V. (Diterjemah oleh Ani & Jasmi Hashim), Pengenalan Kepada Bahan Kejuruteraan, Universiti Teknologi Malaysia, 1997.
5. Lawrence H. Van Vlack, penterjemah, Mohd Razali Muhamad " Bahan untuk Kejuruteraan: Konsep dan Penggunaannya".Dewan Bahasa Dan Pustaka, Kuala Lumpur, 1994.

DBT102 FERROUS METAL

Synopsis

In this subject the student will learn about the classification of ferrous metals and its properties; i.e. steel and iron. Students will be expose to the iron-carbon system which characterise the steel and iron properties. A metallographic analysis technique is introduce to enhance the subject understanding. Student will learn the metal fabrication processes at the end of the subject.

Course Outcome

CO1:
Able to Identify the application of ferrous metal and describe the steel composition and phases exist.
CO2:
Able to compare the properties and microstructure of various steels and iron
CO3:
Able to decide and recommend the metal fabrication processes

References

1. Thomas Higgins R.A Materials For Engineers and Technicans, fourth Edition: Newnes., 2006
2. Ruhiyuddin Mohd Zaki, Faizul Che Pa, Murizam Darus, Mohd Arif Anuar Mohd Salleh, (2012), Logam Ferus, Universiti Malaysia Perlis.
3. Mohd Fitri Mohamad Wahid, Faizul Che Pa, Mohamed Faisol Mohamed Nor, Muhamad Qauyum Zawawi Ahmad Suffin, (2014), Asas Tuangan Dalam Fabrikasi Logam, Universiti Malaysia Perlis.
4. Neely, J.E &Bertone, T.J. (2003). Practical Metallurgy and Materials of Industry. Prentice Hall.
5 W.D. Callister, Jr. & D.G. Rethwisch, 3rd Ed. Fundamentals of Materials

Science and Engineering. John Wiley & Son, 2008 L. Floyd, “Principles of Electric Circuits: Conventional Current Version”, 9th Edition, Pearson Prentice Hall, 2010

DBT107 BASIC STATIC & DYNAMIC

Synopsis

This course aims to expose the students on basic concept of force, moments, moments of couple and resultant force. As for application to this static system, student will study on structure’s equilibrium and stability such as truss, frame and machine. In dynamics, students will be exposed to kinematics and kinetics for particles and rigid bodies which involved the solution by using appropriate methods

Course Outcome

CO1:

Able to solve basic problems of forces and moments in two- and three-dimension, and resultant of force from a system of force.

CO2:

Able to calculate the equilibrium of static and dynamics of a particle and rigid body.

CO3:

Able to relate the kinematics and kinetics for particle and rigid body.

References

1. for engineers : statics / 9th ed. Boston : McGraw-Hill Higher Education , 2010.
2 Ferdinand Beer , Vector mechanics for engineers : statics and dynamics / [and four others], 10th Ed. Boston : McGraw-Hill Higher Education , 2013.
3. Ferdinand Beer, Russell E. Johnston, David F. Mazurek. Vector mechanics for engineers: statics /. Tenth edition. United States : McGraw-Hill Education , 2012
4. Beer, Ferdinand P. 1915-2003. Vector mechanics for engineers : dynamics / Ferdinand Beer, Russell E. Johnston, Phillip J. Cornwell. 10th Edition, McGraw-Hill Higher Education , 2013
5. Hibbeler, R. C,Engineering mechanics. Statics and dynamics, 13th edition, McGraw-Hill Higher Education , 2013.

DBT108 BASIC METAL WORKSHOP

Synopsis

This subject addresses the basic techniques of measurement of geometrically defined dimensions. It also covers the corrective processes of errors and deviations which occur during measurement. The students are also introduced to the cutting, deburring, drilling and tapping processes.

Course Outcomes

CO1:

Able to describe fundamental of basic metal workshop.

CO2:

Able to apply safety procedure in the workshop.

CO3:

Able to apply fundamental of metrology and hand tools according to its characteristic and features in the workshop.

References

1. Arthur R. Gill, Steve F. Krar, Peter Smid, Paul Wanner, Machine Tool Technology Basics, Industrial Press Inc., 2003
2. Bruce J. Black, Workshop Processes, Practices and Materials, Newnes, 2004.
3. Ibrahim C. M., N. Ramudaram, Teknologi Bengkel Mesin, 2000.
4 Walker, John R., 1924- Machining fundamentals from advanced techniques, 2000
5. El-Hofy, Hassan Abdel-Gawad, Advanced machining processes : non-traditional and hybrid processes, McGraw-Hill Professional, 2005

DBT109 CHEMICAL THERMODYNAMICS

Synopsis

Topics which will be covered in this course are as follow: Theory of atoms, molecules, and ions, first law of thermodynamics, second law of thermodynamic, Hess law methods, chemical equilibrium and reaction kinetics.

Course Outcomes

CO1:

Able to employ the basic concept of thermodynamic principles.

CO2:

Able to calculate the basic principles of First Law and Second Law of Thermodynamic

CO3:

Able to compare the principles of Chemical Equilibrium and Kinetic Reaction.

References

1. Chemistry, Raymond Chang. (2015), 10th Edition, McGraw-Hill.
2. Chemical Thermodynamics: Basic Concepts and Method, Irving M. Klotz, Robert M. Rosenberg. (2008) 7th Edition.
3. Introduction to Chemical Engineering Thermodynamics, J. M. Smith, Hendrick \Van Ness, and Michael Abbott (2004)
4. Chemical Thermodynamics for Metals and Materials, Hac Geon Lee. (1999).
5. Introduction to the Thermodynamics of Materials, David R. Gaskell. (1995), 3rd Edition
6. Pengenalan Kimia Metalurgi, Azizan Aziz dan, Kamaruddin Hussin. (1994), Universiti Sains Malaysia.

DBT110 ENGNEERING SCIENCE

Synopsis

This course is to familiarize the student about basic engineering that involve physics and chemistry of materials. Students could understand the theories, principles and standard units that have been focused in the syllabus.

Course Outcomes

CO1:

Able to describe the concept of material's physic and chemistry.

CO2:

Able to describe force, momentum, circular motion principles and wave.

CO3:

Able to solve problems on the basics of electrostatic, electromagnetism and simple DC circuit.

References:

1. W Bolton. "Engineering Science". Fifth Edition. Newnes. 20061.
2. Jerry Wilson, Anthony Buffa. "College Physics", 7th ed., Pearson Education, 2009,USA
3. Giambattista,Richardson,Richardson, "College Physics", McGraw Hill Internationatial Ed., 2007.
4. Stephen T.Thornton, Andrew Rex. "Modern Physics for Scientists & Engineers", 2nd ed, Brooks Cole, 1999.
5. Raymond Chang. Chemistry, (2009), 10th Edition, McGraw-Hill.

DBT111 ENGNEERING DRAWING AND COMPUTER AIDED DRAFTING

Synopsis

The course will cover the details of Engineering Drawing for beginners before going in depth on projection systems followed by oblique and isometric sketches. Knowledge in dimensioning and geometrical tolerance will enhance student's ability in interpreting and assessing information from basic raw data of an engineering drawing. Students will also have the advantage to experience practical engineering drawing projects for familiarity from conceptual exposures and classroom theories taught by the experienced lecturers and teaching engineers. Then, from manual hand drawing, students are taught into the usage of AutoCAD software, which focus on producing drawing in 2D and 3D.

Course Outcomes

CO1:

Able to apply basic skills of engineering drawing in metallurgical engineering related problems.

CO2:

Able to produce engineering drawing by using proper techniques.

References

1. David L. Goetsch, "Technical Drawing and Engineering Communication", 6th ed., Delmar/Cengage Learning, 2010.
2. Grindis, Elliot, "Up and Running with AutoCAD 2014: 2D and 3D drawing and modeling", Elsevier Science, 2013.

REFERENCES
1. Jensen, Cecil Howard, "Engineering Drawing and Design", 7th ed., McGraw-Hill Education, 2008.
2. Madsen, David A, "Engineering Drawing and Design", 4th ed., Delmar/ Thomson Learning, 2007.
3. Simmons, Colin H.,Dennis E. Maguire, Neil Phelps, "Manual of Engineering Drawing", 3rd ed., Newnes/Elsevier, 2009.
4. Gary R Bertoline, Eric N Wiebe, "Fundamentals of Graphics Communication", 4th ed., McGraw-Hill, 2007.
5. Terry T. Wohlers, "Applying AutoCAD 2013", 4th Ed., McGraw-Hill, 2012.
6. Byrnes, David, "AutoCAD 2012 for Dummies", Wiley, 2011.
7. Jamaludin Mohd Taib, Khairul Anwar Hanafiah, "AutoCAD for Engineers".
8. G.V. Krishnan, Thomas A. Stellman, "Introducing AutoCAD 2006", Thomson/Delmar Learning, 2006.

DBT202 NON FERROUS METAL

Synopsis
Students will learn and study the fundamental of non ferrous metal, identification technique, various types of non ferrous metal and their properties and also the various fabrication techniques of non ferrous metals.

Course Outcome
CO1:
Able to describe non ferrous metal, its application and processing techniques.
CO2:
Able to demonstrate the microstructure of alloys, mechanical behavior and appropriate testing.
CO3:
Able to investigate between ferrous metal and non ferrous metal.

References
1. Higgins R.A.,(2006). Materials For Engineers and Technicans, fourth Edition: Newnes.
2. Ruhiyuddin Mohd Zaki, Faizul Che Pa, Murizam Darus, Mohd Arif Anuar Mohd Salleh, (2012) ,Logam Bukan Ferus, Universiti Malaysia Perlis.
3. Mohd Fitri Mohamad Wahid, Faizul Che Pa, Mohamed Faisol Mohamed Nor, Muhamad Qauyum Zawawi Ahmad Suffin, (2014), Asas Tuangan Dalam Fabrikasi Logam, Universiti Malaysia Perlis.
4. Neely, J.E &Bertone, T.J. (2003). Practical Metallurgy and Materials of Industry. Prentice Hall.
5. WD. Callister, Jr. & D.G. Rethwisch, 3rd Ed. Fundamentals of Materials Science and Engineering. John Wiley & Son, 2008

DBT203 METAL EXTRACTIVE TECHNOLOGY

Synopsis
This course is proposed to provide students with fundamentals of metal extraction from ores using pyrometallurgy process, hydrometallurgy process and electrometallurgy process. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes
CO1:
Able to explain the principle of extractive metallurgy.
CO2:
Able to apply fundamental of extractive metallurgy in hydrometallurgy process.
CO3:
Able to compare between pyrometallurgy and electrometallurgy process.

References
1. Pengenalan Kepada Pemprosesan Fizikal Mineral, Shahrizam Saad, Faizul Che Pa, Abdullah Chik & Mohamed Faisal Mohamed Noor, UniMAP, 2013.
2. Asas Proses Metalurgi / Shamsul bahar Sadli, Dewan Bahasa dan Pustaka, 1997.
3. Engineering Metallurgy: Part two: Metallurgical Process Technology/ Higgins, R.A, Hodded & Stoughon, 1983.
4. Principle of Extractive Metallurgy / Terkel Rosenqvist, McGraw Hill, 1986.
5. Pengenalan Kimia Metalurgi / Azizan Aziz, Kamarudin Hussin, Pulau Pinang: Penerbit USM 1998.
6. Wills, B. A. (2006). Will's Mineral Processing Technology (Seventh ed.): Butterworth-Heinemann.

DBT204 TECHNOLOGY OF METAL WELDING 1

Synopsis

Introduction to the basic theory of welding, brazing and soldering. The course also covers the equipments, procedures and applications of various welding processes such as shielded metal arc welding (SMAW), oxyacetylene welding (OAW), and resistance welding. The students will also be exposed to the welding metallurgy, microstructure examination and destructive welding tests.

Course Outcome

CO1:
Able to describe the fundamental theory, principles, process, equipment and application of welding, brazing and soldering.
CO2:
Able to apply skills in Shielded Metal Arc Welding (SMAW).
CO3:
Able to plan weld evaluation via destructive welding tests and microstructure examination.

Reference

1. Welding Skills, Third Edition, B.J. Moniz, R.T. Miller, American Technical Publisher, Inc., 2004.
2. Mohler, R., Practical Welding technology, Industrial Press Inc., 1983.
3. Teknologi Kimpalan dan Fabrikasi Logam, The Ser kok, Penerbit Fajar Bakti Sdn. Bhd., 1988.
4. Zainal Abidin Ahmad, Proses Pembuatan Jilid II, Universiti Teknologi Malaysia, 1999.
5. Teori amalan bengkel kejuruteraan, Amir Yazid Ali & Zaimi Mat Isa, Bentong : PTS Publications & Distributors , 2004.

DBT206 FOUNDRY TECHNOLOGY

Synopsis

This course is developed to expose the students to the fundamentals, step-by-step processes involved in castings and aspects that affect the quality of the castings. The topics which will be covered in this course are as follows; introduction to foundry technology, metallurgy in casting, technology of pattern making, technology of molding and coremaking, gating system of casting, technology of melting and casting, technology of molding and casting, defects in castings, castings evaluation tests.

Course Outcome

CO1:
Able to analyze the technology of foundry and the processes of casting.
CO2:
Able to assemble pattern making process, mold making, melting and casting, and casting finishing.
CO3:
Able to analyze casting defects, causes and remedies.

Reference

1. Jain, P.L. (2003). Principles of Foundry Technology. Tata McGraw-Hill New Delhi.
2. Peter Beely (2001). Foundry Technology. 2nd Edition, Butterworth Heinemann.
3. Neely, J.E & Bertone, T.J. (2003). Practical Metallurgy and Materials of Industry. Prentice Hall.
4. Schey, J.A. (2000). Introduction to Manufacturing Processes. McGraw Hill.
5. Zainal Abidin Ahmad, (1999). Proses Pembuatan Jilid 1. UTM.
6. Freirer John L. & John D.Lindbeck. (1999). Metal Technology and Process. Albany: Delmar Publishers.
7. Mikell P. Groover (2007). Fundamentals of Modern Manufacturing – Materials, Processes, and Systems, 3rd Edition, John Wiley & Sons Inc.
8. Kalpakjian S. & Schmid S. (2006). Manufacturing Engineering and Technology. 5th Ed. In SI Units, Prentice Hall.

DBT208 TECHNOLOGY OF METAL WELDING 2

Synopsis

The course covers the basic theories and practical knowledge of Gas Metal Arc Welding (GMAW), Gas Tungsten Arc Welding (GTAW), welding evaluation and various types of non-destructive tests. The course also exposes the students to other welding processes such as surfacing, cutting operations and repair welding. The students are also introduced to the general welding considerations of carbon and alloy steels, tool steels and cast irons, stainless steels and nonferrous metals.

Courses Outcome

CO1:
Able to understand, perform and improve skills in Gas Metal Arc Welding (GMAW) and Gas Tungsten Arc Welding (GTAW) techniques.
CO2:
Able to understand and describe the welding technology and the processes

of surfacing, cutting and repair welding.
CO3:
Able to assess welding quality and perform weld evaluation via non-destructive welding examinations.

Reference

1. Welding Skills, Third Edition, B.J. Moniz, R.T. Miller, American Technical Publisher, Inc., 2004.
2. Mohler, R., Practical Welding technology, Industrial Press Inc., 1983.
3. Teknologi Kimpalan dan Fabrikasi Logam, The Ser kok, Penerbit Fajar Bakti Sdn. Bhd., 1988.
4. Zainal Abidin Ahmad, Proses Pembuatan Jilid II, Universiti Teknologi Malaysia, 1999.
5. Teori amalan bengkel kejuruteraan, Amir Yazid Ali & Zaimi Mat Isa, Bentong : PTS Publications & Distributors , 2004.

DBT 209 METALS TESTING

Synopsis
This subject will introduce the students to the theory and practical aspects of conducting the destructive and non-destructive tests such as compression test, Charpy impact testing, hardness test, magnetic particle test and liquid penetration test. The students are also exposed to the specific uses and operation of each test.

Course Outcome
CO1:
Able to describe the important of metal testing and defects.
CO2:
Able to identify and operate the destructive metal testing machine.
CO3:
Able to analyze several types of non-destructive testing.

Reference

1. Alok Nayar, Testing of Metals, McGraw Hill Education, 2005
2. WD. Callister, Jr. & D.G. Rethwisch, 9th Ed. Fundamentals of Materials Science and Engineering. John Wiley & Son, 2014
3. Feirer, John L. (1999). Metal Technology and Process. Albany: Delmer Publication.
4. Serope Kalpakjian. (1995). Manufacturing Engineering and Technology, 7th Edition. Addison-Wesley Publishing Company.
5. John Witey; (1993).Failure of Materials in Mechanical Design: Analysis, Prediction,Preventation

DBT210 STRENGTH OF MATERIALS

Synopsis
The main objective of this course is to expose the student on basic concept of strength of materials which dealing with relationships between the external loads applied to an elastic body and the intensity forces acting within the body, axial load, mechanical properties of materials, torsion, shear forces and bending moments in beams and combined stresses.

Course Outcome
CO1:
Able to define and describe the basic concept of stresses.
CO2:
Able to define and describe stress-strain diagram, allowable stresses, factor of safety, centroid of gravity and moment of inertia.
CO3:
Able to identify and calculate stress distribution and the angle of twist subjected to torsional loads.
CO4:
Able to identify the types of beam and evaluate the loadings and flexure formula for a beam, shear force and moment diagrams.

Reference

1. S S Rattan, Strength of Materials, 2nd Edition , McGraw-Hill, 2011
2. Negi,L.S Strength of Materials, Tata McGraw-Hill Publishing. 2008.
3. Singh,D.K, Strength of Materials, Ane Books India/CRC Press, 2008
4. Cheng, Static and Strength of Materials, Mc Graw Hill, 2006

DBT211 BASIC MACHINING OF METALS

Synopsis
The subject covers the basic of metallurgy in machining and basic operation of grinding, lathe and milling. The students are expected to understand the basic machine tool technology and able to setup and operate grinding, lathe and milling machines.

Course Outcome
CO1:
Able to identify the metallurgy in machining and factors affecting the machinability of metals.
CO2:
Able to apply fundamental of conventional machining processes.

CO3:
Able to describe fundamental of advanced machining processes.

Reference

1. Arthur R. Gill, Steve F. Krar, Peter Smid, Paul Wanner, Machine Tool Technology Basics, Industrial Press Inc., 2003
2. John L. Fairer and John D. Lindbeck, Metal Technology and Process, Delmar Publishers.
3 P. N. Rao, Manufacturing Technology, Metal Cutting & Machine Tools, McGraw Hill, 2000.

DBT301 POWDER METALLURGY

Synopsis

The course focuses on the basic principles of powder metallurgy technology and the practical skills of the metalworking techniques. The students will be taught on the basic theory and principles of powder characterization and fabrication, pre-compaction powder handling, compaction, sintering and compact characterization. In the laboratory projects, students will be exposed to the powder metallurgy techniques such as powder characterization analysis, powder mixing and blending, powder compaction, sintering process, microstructural features, pore characteristics and mechanical properties.

Course Outcome

CO1:
Able to describe the basic of powder metallurgy principles and technology
CO2:
Able to practice the techniques involves and produce powder metallurgical product
CO3:
Able to construct the microstructure, pore characteristics and mechanical properties of powder metallurgical product.

Reference

1. German, Randall M., Powder Metallurgy Science, 1994.
2. German, Randall M., Sintering Theory and Practice, 1996.
3 F. Thummler & R. Oberacker, An introduction to Powder Metallurgy,1993.
4. Leander F. Pease, III & William G. West, Fundamentals of Powder Metallurgy,2002.
5. Suk-Joong L. Kang , Sintering : densification, grain growth and microstructure /. Sintering : densification, grain growth and microstructure / Suk-Joong L. Kang.

DBT302 HEAT TREATMENT

Synopsis

This course is offered to deliver the knowledge of phase diagram, microstructure and composition in metals and alloys, develop ability to describe the principles and applications of heat treatment and to relate the properties of metals after the heat treatment processes. The topics which will be covered in this course are as follows; Introduction of Solidification Process; Phase Diagram for Pure Elements, The Gibbs Phase Rule, Cooling Curve; Binary Phase Diagram; Lever Rule; Non-equilibrium Solidification of Alloy; Heat Treatment and Application; Principles of Heat Treatment for steel and non-ferrous metal; and Solution Treatment.

Course Outcome

CO1:
Able to interpret phase diagrams, microstructure and composition in metals and alloys.
CO2:
Able to propose different heat treatment process for different application.
CO3:
Able to evaluate the properties of metals after heat treatment process.

Reference

1. Neely, J.E &Bertone, T.J. (2003). Practical Metallurgy and Materials of Industry. Prentice Hall.
2 V Ranghavan, (2001) Materials Science and Engineering, A First Course, Prentice-Hall of India
3. Ruhiyuddin Mohd Zaki, Faizul Che Pa, Murizam Darus, Mohd Arif Anuar Mohd Salleh, (2011), Logam Ferus, Universiti Malaysia Perlis.
4 W D. Callister, (2007), Materials Science and Engineering, An Introduction, John Wiley and Sons, Inc., New York, 3rd Edition,
5. Porter, D. A. and Easterling K, (1992),Phase Transformations in Metals and Alloys, 2nd edition, Routledge.

DBT303 METALS PROTECTION

Synopsis

This course is to expose students to the theory of metals corrosion in different environments, its damage to the community and its possible preventions and countermeasures. The topics covered in this course are as follows; the principles of corrosion, types of corrosion, surface technology, tribology, surface coatings and metals protection methods.
Course Outcome

CO1:
Able to analyze the theory, principles, and processes of metals corrosion.
CO2:
Able to analyze the types of metals corrosion and their causes.
CO3:
Able to construct corrosion prevention and metals protection methods.

Reference

1. Einar Mattsson (1996). Basic Corrosion Technology For Scientists and Engineers. 2nd Edition, The Institute of Materials.
2. Mars G. Fontana (1986). Corrosion Engineering, McGraw-Hill International Edition.
3. Denny A. Jones (1996). Principles and Prevention of Corrosion.
4. Zaki Ahmad (2006). Principles of Corrosion Engineering and Corrosion Control, Butterworth Heinemann.
5. D.Feron(2001).Marine Corrosion of Stainless Steels, IOM.
6. Coated Metal Structure and Properties of Metal-coating Compositions, Springer, 2002.
7. W D. Callister, "Materials Science and Engineering, An Introduction 3rd Edition," John Wiley and Sons, Inc., 2008.

DBT304 OCCUPATIONAL SAFETY AND QUALITY MANAGEMENT

Synopsis

This course is intended to provide an introductory knowledge in occupational safety and quality management. It provides basic information and common theories for prospective safety and quality personnel to oversee a program that encompasses both areas of responsibility. At the end of this course, students are expected to be able to identify suitable quality techniques and tools to be implemented in production management and can apply Industrial Safety standards in real industrial environment.

Course Outcome

CO1:
Ability to define and describe the fundamental of occupational safety and apply the theories of accident causation.
CO2:
Ability to evaluate safety rules and regulations by comparing them to specific standards of OSH act and occupational hazards.
C03:
Ability to apply and compare the various types of quality management and system, statistical process control (SPC) and quality standard.

Reference:

1. David L. Goetsch, The Basics of Occupational Safety, Pearson Prentice Hall, 2010.
2. Paul T.J. James, Total Quality Management: an Introductory Text, Pearson Prentice Hall, 1996.
3. C. Ray Asfahl, Industrial Safety and Health Management, 5th ed., Pearson Prantice Hall, 2003.
4. David L. Goetsch,Quality Management – Introduction to Total Quality Management for Production, Processing, and Services. 5th Ed., Pearson Prantice Hall, 2006.
5. David L. Goetsch, Occupational Safety and Health, for Technologists, Engineering, and Managers., 4th ed., Prentice Hall. 2002.
6. Willie Hammer, Dennis Price, Occupational Safety Management and Engineering., 5th ed., Prentice Hall. 2001.
7. Howard S. Gitlow et. al,Quality Management, 3rd ed., McGraw-Hill. 2005

DBT351 SEMESTRAL PROJECT

Synopsis

This course is a small scale research projects for final year students and expected to be completed within the same. The projects are based of solving the engineering problem by understand the problems, troubleshooting, identify, solves and finally report writing for the documentation purposes.

Course Outcome

CO1:
Able to identify solution based on problem study.
CO2:
Able to design engineering solution utilizing an engineering practice.
CO3:
Able to perform an engineering project.
CO4:
Able to propose a technical report and communicate in oral presentation.

Reference

1. Semestral Project's Guideline for Diploma Engineering Programmes, UniMAP, 2008
2. Any publish material such as writing, multimedia or personal communication that related to the project topics

PROGRAM KEJURUTERAAN

ELEKTRIK

PROGRAM DIPLOMA KEJURUTERAAN ELEKTRIK

PENGENALAN

Diploma Kejuruteraan Elektrik merupakan program yang dijalankan untuk memberi lebih penekanan kepada rekabentuk pemasangan, peralatan sistem elektrik dan juga peralatan elektronik kuasa untuk kegunaan industri. Program ini bertujuan melahirkan tenaga kerja di peringkat ikhtisas yang mahir serta mempunyai pengetahuan yang kukuh dalam bidang kejuruteraan elektrik. Pelajar akan dilatih untuk menjadi Pembantu Jurutera Elektrik yang berkemampuan menjalankan tugas dalam bidang
merekabentuk pemasangan, penyelenggaraan, pengujian, pentauliahan, jualan, perundingan, pendidikan serta latihan. Para graduan akan berkemampuan menjalankan tugas-tugas pengurusan yang memerlukan kebolehan membuat pertimbangan yang teliti dan tepat. Dengan adanya kemudahan makmal yang baik seperti Makmal Loji Sistem Kuasa (11kV), Makmal Mesin Elektrik, Makmal Sistem Kuasa, Makmal Elektronik Kuasa, Makmal Elektronik Termaju, Makmal Instrumentasi & Pengukuran yang mempunyai peralatan yang setaraf dengan industri, maka pelajar yang dilatih oleh pusat pengajian ini mampu menjalankan tugas semasa bekerja nanti. Selain itu juga, pelajar-pelajar disarankan supaya mengambil pemeriksaan Sijil Kompetensi dengan Suruhanjaya Tenaga seperti Sijil Kompetensi Pendawai Fasa Tiga dan Penjaga Jentera.

PROGRAM YANG DITAWARKAN:

- Diploma Kejuruteraan Elektrik

PELUANG KERJAYA

Graduan lulusan Diploma Kejuruteraan Elektrik mempunyai prospek pekerjaan yang luas sama ada dalam syarikat swasta, industri, jabatan kerajaan dan badan-badan berkanun. Bidang kerjaya untuk graduan boleh terdiri dari sektor elektrik secara khususnya dan elektronik secara amnya antaranya:

- Industri Pengeluaran dan Pembuatan, Industri Pemasangan dan Pertauliahan
- Industri Penyelenggaraan dan baikpulih
- Firma Perunding Kejuruteraan Elektrik
- Industri Semikonduktor
- Firma Penyelidikan dan Pembangunan
- Institusi Pendidikan dan Kemahiran

Antara kerjaya berkaitan bagi graduan Diploma Kejuruteraan Elektrik:

- Juruteknik
- Pembantu Jurutera
- Pembantu Pegawai Latihan Vokasional

PROGRAM DIPLOMA KEJURUTERAAN ELEKTRIK

TAHUN	PERTAMA		KEDUA		KETIGA	
SEMESTER	I	II	III	IV	V	VI
Kursus Teras Kejuruteraan (81)	DKA 104/2 Matematik Awalan	DQT 101/3 Matematik1	DQT 102/3 Matematik II	DQT 203/3 Matematik III	DET 308/3 Sistem Kuasa I	DIT 361/6 Latihan Industri
	DET 116/3 Asas Pengaturcaraan Komputer	DET 101/3 Asas Litar Elektrik I	DET 202/3 Asas Litar Elektrik II	DET 203/3 Pengukuran Elektrik & Instrumentasi	DET 309/3 Elektronik Kuasa	
	DCT 100/2 Asas Kemahiran Kejuruteraan	DET 113/3 Sistem Digit	DET 214/3 Pengawal Logik Boleh Aturcara	DET 205/3 Mesin Elektrik & Aplikasi II	DET 310/3 Amalan Pertauliahan & Penyelenggaraan Sistem Elektrik	
	DMT 114/2 Sains Kejuruteraan	DET 115/3 Peranti Elektronik	DET 204/3 Mesin Elektrik & Aplikasi I	DET 206/3 Sistem Kuasa I	DET 351/3 Projek Semestral	
	DUT 123/2 Kemahiran Teknologi Dalam Komunikasi	DET 119/3 Mikropengawal	DET 218/3 Elektronik Analog	DET 207/3 Rekabentuk Pemasangan Elektrik	DET 320/3 Keselamatan Industri, Pengurusan Kualiti dan Etika	
	DET 111/3 Lukisan Kejuruteraan			DET 212/3 Prinsip Kawalan		
81	12	15	15	18	15	6
Kursus Wajib Universiti (14)	DWV101/2 Bahasa Inggeris Komunikasi 1	DWV201/2 Bahasa Inggeris Komunikasi 2	DWV301/2 Bahasa Inggeris Komunikasi 3			
		DWV410/2 Bahasa Melayu	DUV239/2 Pengajian Malaysia II		DUV224/2 Keusahawaan Kejuruteraan	
	DZWXXX/1 Badan Beruniform 1	DZWXXX/1 Badan Beruniform 1				
14	3	5	4	0	2	
95	15	20	19	18	17	6

Notes:
DKA104/2 Matematik Awalan : Prasyarat untuk Matematik Tambahan peringkat SPM dengan gred D

DETAILED SYLLYBUS FOR ELECTRICAL ENGINEERING

DET 101/3 ELECTRIC CIRCUIT FUNDAMENTAL I (ASAS LITAR ELEKTRIK I)

Synopsis

This course can be divided into two parts. Part I, consisting of chapter 1 through 3, is devoted to DC circuits. It covers fundamental laws and theorems, methods of circuit analysis and circuit theorems involving DC circuits. Part 2, consisting of chapter 4 through 5, deals with ac circuits. It introduces phasors, RLC circuits, circuit analysis in ac, ac power calculations and power factor correction.

Course Outcome

CO1:

Able to explain the concepts of charge, current, voltage, power, operation and elementary application of resistors, capacitors, inductors, ideal current and voltage source in electrical circuit and its basic laws.

CO2:

Able to analyze linear circuits based on nodal analysis which is based on application of Kirchhoff's Current Law (KCL), and mesh analysis which is based on application of Kirchhoff's Voltage Law (KVL).

CO3:

Able to analyze and make decision in complex linear circuits on how to simplify the circuit analysis using circuit theorem which includes Thevenin's and Norton's Theorems, superposition, source transformation and maximum power transfer

References:

1. Charles K. Alexander & Matthew N.O.Sadiku, 'Fundamentals of Electric Circuits',
2. International 6th Ed., McGraw-Hill, 2016.
3. Nilsson, J.W., Riedel, S.A., 'Electric Circuits', 10th Ed., Prentice Hall, 2014.
4. Irwin, J.D., Nelms, R.M., 'Basic Engineering Circuit Analysis', 11th Ed., John Wiley, 2015.
5. Robbins, A.H, Miller, W.C., 'Circuit Analysis: Theory and Practice, 5th Ed., Thomson/Delmar Learning', 2015.
6. Hyat W.H., Durbin, S.M., Kimmerly, J.E., Engineering Circuit Analysis, 8th Ed., McGraw Hill, 2011.

DET 111/3 ENGINEERING DRAWING (LUKISAN KEJURUTERAAN)

Synopsis

The main objective of this course is to expose the Diploma Engineering students with basic concept of engineering skills and its application. This course will help students to identify and familiarize with types of projection and sketches used in engineering drawing and also learn about tools used in computer-aided drafting. From manual hand drawing to the usage of AutoCAD software, students will be able to further understand the proper ways in dimensioning and will be able to translate information from a good engineering drawing. AutoCAD software will focus more on product design in 2D.

Course Outcome

CO1:

Able to identify basic skills of engineering drawing in engineering related problems.

CO2:

Able to illustrate engineering drawing in well-defined engineering practices.

CO3:

Ability to apply suitable drawing techniques, skills and engineering tools to well-defined engineering activities

CO4:

Able to perform in group/teams to illustrate engineering drawing

References:

1. David L. Goetsch, "Technical Drawing and Engineering Communication", 6th ed., Delmar/Cengage Learning, 2010.
2. Grindis, Elliot, "Up and Running with AutoCAD 2014: 2D and 3D drawing and modeling", Elsevier Science, 2013.
3. Jensen, Cecil Howard, "Engineering Drawing and Design", 7th ed., McGraw-Hill Education, 2008.
4. Madsen, David A, "Engineering Drawing and Design", 4th ed., Delmar/ Thomson Learning, 2007.
5. Simmons, Colin H.,Dennis E. Maguire, Neil Phelps,"Manual of Engineering Drawing", 3rd ed., Newnes/Elsevier, 2009.
6. Gary R Bertoline, Eric N Wiebe, "Fundamentals of Graphics Communication", 4th ed., McGraw-Hill, 2007. vii. Terry T. Wohlers, "Applying AutoCAD 2013", 4th Ed., McGraw-Hill, 2012.
7. Byrnes, David, "AutoCAD 2012 for Dummies", Wiley, 2011.
8. Jamaludin Mohd Taib, Khairul Anwar Hanafiah, "AutoCAD for Engineers".
9. G.V. Krishnan, Thomas A. Stellman, "Introducing AutoCAD 2006", Thomson/Delmar Learning, 2006.

DET113/3 DIGITAL SYSTEM (SISTEM DIGIT)

Synopsis

This course introduces students to the fundamentals of digital electronic circuit's familiarization through exposure of basic logic gates. The course then develops students to appreciate simple digital applications such as arithmetic combinational logic circuit. Flip-flops and its basic application are introduces in the later part of the course then followed by Shift Register and Counter. Students are expected to design a simple digital system and can demonstrate their understanding in Mini Project.

Course Outcome

CO1:
Able to demonstrate theoretical concepts of digital system
CO2:
Able to analyze mathematical models to solve digital circuit configuration.
CO3:
Able to design digital circuit for various digital applications.
CO4:
Able to perform in group to design digital circuit

References:

1. Floyd, Thomas L., "Digital Fundamentals", 11th Edition by Pearson 2014.
2. Ronald J. Tocci, "Digital Systems – Principles and Applications," 12th Ed., Prentice Hall, 2016.
3. Godse, Atul P. Godse, Deepali A. Godse, Gurpreet Singh Ghai, "Digital Electronics", Technical Publications Pune, 2014.
4. Nigel, P.C. "A First Course in Digital Electronics" 2st Ed. Prentice Hall, 2003.

DET115/3 ELECTRONIC DEVICES (PERANTI ELEKTRONIK)

Synopsis

This course introduces basic semiconductor devices such as diode, Bipolar Junction Transistor (BJT) and Field-Effect Transistor (FET) theory. The syllabus consists of:

- Understanding the principles and operation of semiconductor devices
- Investigates the applications of these devices.
- Solving BJT and FET parameters using various type of biasing.

Course Outcome

CO1:
Able to determine diode applications as rectifiers, limiters, clampers and multipliers
CO2:
Able to analyze Bipolar Junction Transistor (BJT) and Field Effect Transistor (FET) operation and biasing
CO3:
Able to evaluate diode operation by understanding the theory of semiconductor materials

References:

1. Floyd, T. "Electronic Devices (Conventional Current Version)", 9th Edition, Prentice Education Limited, 2014.
2. Boylestad, R.L. & Nashelsky, L. "Electronic Devices and Circuit Theory", 11th Edition, Prentice Hall, 2015.
3. Floyd, T & Buchla, D. "Electronics Fundamentals: Pearson New International Edition: Circuits, Devices & Applications", 8th Edition, Pearson, 2013.
4. Donald A. Neamen, Microelectronics Circuit Analysis and Design (2009), 4th Edition, McGraw-Hill International Edition.
5. Robert T. Paynter, (2005). Introductory Electronic Devices and Circuits. 9th Ed.: Prentice Hall.
6. Ahmad Radzi Mat Isa, Yaacob Mat Daud, Roslinda Zainal, " Elektronik Asas Peranti Semikonduktor", ISBN 983-52-0419-5, 2007.

DET1163 BASIC COMPUTER PROGRAMMING (ASAS PENGATURCARAAN KOMPUTER)

Synopsis

In this course, students learn computer system introduction, problem solving analysis and programming concept including variables, operator, control structure, function, array, file processing, structure and pointer. Student also learn how to write programming using C language and solve engineering related problem using computer programming technique.

Course Outcome

CO1:
Able to discuss programming concept and principle
CO2:
Able to use computer for coding, compiling, executing and debugging computer software program
CO3:
Able to solve engineering related problems using computer programming techniques
CO4:
Able to design program using flowchart and pseudocode

References:

1. Deitel & Deitel,"C How to Program", Pearson, 2016
2. Deitel & Deitel, Suhizaz Sudin, R. Badlishah, Yasmin Yacob "C How To Program", Pearson-Prentice Hall, 2006
3. Cheng, H., "C for Engineers and Scientist", McGraw Hill, 2010
4. Tan & D Orazio "C Programming for Engineering & Computer Science", Mc Graw Hill , 1999
5. Forouzan, B. A. & Gilberg R. F., "Computer Science: A Structured Programming Approach Using C" . Brooks/Cole, 2001
6. Al Kelley, Ira Pohl, "C by Dissection: The Essentials of C Programming" 4th ed., Addison-Wesley, 2000

DET1193 MICROCONTROLLER (MIKROPENGAWAL)

Synopsis

The aim of this course is to study the Intel 8051 Microcontroller architecture and relate that knowledge to the design of microcontroller based systems. This includes the design technique using internal I/O interfacing, internal memory and introduction to interrupt configuration for the systems. The study of 8051 instruction set and various software development tools are also emphasized as the knowledge are needed in the designing of controller-based systems.

Course Outcome

CO1:
Able to discuss the theory and basic architecture of microcontroller.
CO2:
Able to write program using assembly language.
CO3:
Able to demonstrate microcontroller interfacing to the I/O devices.
CO4:
Able to develop a simple application based on microcontroller system.

References:

1. Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay, "The 8051 Microcontroller and Embedded Systems Using Assembly and C", 2nd Edition, Pearson, 2014
2. I. Scott MacKenzie, Raphael C. W. Phan, "The 8051 Microcontroller", 4th Edition, Prentice Hall, 2007
3. James W. Stewart, Kai X. Miao, "The 8051 Microcontroller – Hardware, Software and Interfacing", 2nd Edition, Prentice Hall, 1999

DET202/3 ELECTRIC CIRCUIT FUNDAMENTAL II (ASAS LITAR ELEKTRIK II)

Synopsis

This course will introduce the students to the AC Circuit, methods of circuit analysis and application of circuit law. Students also will be exposed to the magnetic circuit and two port networks. Lastly it will cover the balanced three phase system in AC circuit.

Course Outcome

CO1:
Able to identify and explain the electrical component and electrical rules in AC circuit
CO2:
Able to analyze AC circuit using method of circuit analysis
CO3:
Able to analyze AC circuit using two port networks parameter
CO4:
Able to analyze basic magnetic circuit using the mesh analysis and dot determination
CO5:
Able to create a balanced three phase system in AC circuit

References:

1. Charles K. Alexander & Mathew Sadiku, " Fundamental of Electric Circuit", 6th Edition, McGraw-Hill, 2016
2. J.W. Nilsson & S.A. Reidel, "Electric Circuit", 9th Edition, Prentice Hall, 2010.
3. Richard C. Dorf & James A. Svoboda, "Introduction to Electric Circuits", 9th Edition, John Wiley & Sons, 2014.
4. J. David Irwin & Chwan-Hwa Wu, "Basic Engineering Circuit Analysis", 11th Edition, John Wiley & Sons, 2016.
5. Clayton R. Paul, Charles Paul, "Fundamentals of Electric Circuit Analysis", 4th Edition, John Wiley & Sons, 2015.
6. Johnson, D.E. Johnson, J.R. & Hilburn, J.L., "Basic Electric Circuit Analysis", 5th Edition, Prentice Hall, 1996.

DET203/3 ELECTRICAL INSTRUMENTATION AND MEASUREMENT (PENGUKURAN ELEKTRIK & INSTRUMENTASI)

Synopsis

The ability of electrical and computer engineering students to make measurements is vital to an understanding of the physical world, especially for electrical sites. Measurement provides an understanding of electrical phenomena and instruments are tools for measurement. The topics that discussed in this instrumentation and measurement course are: error and data manipulation, DC Ammeter, DC Voltmeters, AC meters, Ohmmeters, Multimeters, Bridges, Oscilloscopes, and sensor transducer.

Course Outcome

CO1:
Able to apply the basic principles of measurement and instrumentation to minimise error
CO2:
Able to categorize the sensors and transducer for measurement of non-electrical quantity
CO3:
Able to evaluate the DC bridges and AC bridges in the electrical measurement
CO4:
Able to design the system of DC ammeter, DC voltmeter, AC meter and oscilloscope in electrical measurement

References:

1. Alan S Morris, Reza Langari" Measurement and Instrumentation Theory and Application, 2nd edition, AP, Elsevier 2016
2. U.A Bakshi, A.V. Bakshi, K.A. Bakshi, "Electrical Measurements and In Theory and Instrumentation, 1st ed., Technical Publications, 2014.
3. H.S Kalsi, "Electronics Instrumentation", Tata-McGraw Hill, 2010.

DET204/3 ELECTRICAL MACHINES & APPLICATION I (MESIN ELEKTRIK & APLIKASI I)

Synopsis

Basically this course can be divided into five main topics. Topic 1 are transformer which cover basic construction, equivalent circuits, phasor diagram, per unit system, efficiency and voltage regulation, open circuit test and short circuit test, instrument transformer. Topic 2 are three phase transformer which cover basic construction, open circuit test and short circuit test, the three phase transformer connections, the parallel transformer operations, the cooling types, tap changer and their operations and the principle operation of autotransformer, Topic 3 basically on DC machine fundamentals. Topic 4 covers direct current motors which cover basic, construction, equivalent circuit, magnetizing curve, separately excited and shunt motor, series motor and compound dc motor. Topic 5 is focus DC generator which cover basic the principles, the equivalent circuit, the terminal characteristic and control terminal voltage. Topic 6 basically on AC machine fundamentals, while last topic covers on three phase induction machine which include basic construction and operations, modes of operation, speed control and selection of induction motor . Lab intensive for 2 hours once a week covers all the topics.

Course Outcome

CO1:
Able to apply the principle, standard equivalent circuit and fundamental equations describing the behavior of various general purpose DC machines
CO2
Able to analyze the principle, standard equivalent circuit and fundamental equations describing the behavior of a three-phase induction motor
CO3
Able to construct the principle, standard equivalent circuit and fundamental equations the behavior of single phase and three-phase transformers

References:

1. Stephen J. Chapman, (2010). 'Electric Machinery Fundamentals'. 5th ed., McGraw-Hill.
2. Theraja B.L. (2007). 'A Text Book of Electrical Technology'. Volume II (AC & DC Machines), S.Chand & Company Ltd.
3. Wildi, T., (2005). 'Electrical Machine, Drives and Power System'. 6th. ed, Prentice-Hall.
4. Charles A. Gross, (2007). 'Electric Machines'.
5. CRS Press. Bhattacharya S.K. (2008). 'Electrical Machines'. 3rd ed. Tata McGraw-Hill.

DET205/3 ELECTRICAL MACHINE & APPLICATIONS II (MESIN ELEKTRIK & APLIKASI II)

Synopsis

Basically this course can be divided into five main topics. Topic 1 is focus on three phase transformer connections which include principles operations, functions, equivalent circuit and it characteristics.

Topic 2 covers principles operation, equivalent circuits and terminal characteristics of DC generator.

Topic 3 covers on single phase induction motor which include principle operations, equivalent circuit and typical application and it characteristics. Topic 4 covers principle operation, equivalent circuit, power and torque, parameter and effect of load change of synchronous motor. Topic 5 covers the introduction to motor starter and last topic covers testing and maintenance of electrical machines.

Course Outcome

CO1
Ability to describe the operational characteristics of DC generator, single phase induction motor and synchronous motor
CO2
Ability to analyze the various types of single phase induction motors and to choose the best motor for given application
CO3
Ability to formulate the industrial applications of transformer and electrical machines
CO4
Ability to develop the test equipment and practices commonly used in motor starter

DET206/3 POWER SYSTEM I (SISTEM KUASA I)

Synopsis

This course covers topics of introduction and basic analysis to power generation, transmission line parameters study and symmetry & unsymmetrical faults study. This course intends to give the students fair knowledge about electrical power system which focuses on the following concepts: fundamental theory lectures, lab-intensive works in order to strengthen student's understanding, knowledge and expose them to the real practical applications.

Course Outcome

CO1:
Able to apply the principle of typical power generation plants and their operation concept in electrical power system.
CO2:
Able to employ knowledge of power transmission line and their element's parameters concept.
CO3:
Able to calculate the faults in symmetrical and asymmetrical component of power system
CO4:
Able to design the capacitance of power factor with analysis on the theoretical concept of power in three phase AC circuit

References:

1. Hadi Saadat, "Power System Analysis", 5th Edition, PSA, 2014.
2. Granger, Stevenson. Jr. "Power System Analysis", 2nd ed, McGraw Hill, 2016
3. D.P. Kothari, "Modern Power System Analysis", 4th Edition, McGraw Hill, 2011.
4. Glover, Sarma "Power System Analysis and Design, 5th ed., Cengage Learning, 2012

DET206/3 ELECTRICAL INSTALLATION DESIGN (REKABENTUK PEMASANGAN ELEKTRIK)

Synopsis

This course is designed and structured to provide electrical assistant engineers /technical assistant with the application skills needed in modern electrical engineering practice. This course uses a combination of theory and practical 'hands on' case studies to demonstrate and reinforce the principles. Students in this course are expected to work through the case studies. The case studies are based on actual installations and projects.

Course Outcome

CO1:
Ability to design an electrical Installation on lighting system and final circuit of a building based on JKR and IES standard.
CO2:
Ability to design electrical installation on Switchgear and Capacitor Bank of a building based on IEC standard.
CO3:
Ability to design electrical installation on cables and protection of a building based on IEC and IEE standard
CO4:
Prepare actual working drawings of electrical project

References:

1. N.Hasnizam & M.Rafi. (2009). Lectures Notes: Electrical Installation Design. PPKSE.
2. BSI & IEE. (2008). BS 7671 (2008) Requirements For Electrical Installations – IEE Wiring Regulations. 17th Edition. Polestar Wheatones.
3. G.Stokes & J.Bradley. (2009). A Practical Guide To The Wiring Regulations – 17th Edition IEE Wiring Regulations (BS 7671:2008). 4th ed. John Wiley & Sons.
4. T.Linsley. (2008). Basic Electrical Installation Work. 5th ed. UK: Elsevier & Newnes Press.
5. T.Linsley. (2008). Advanced Electrical Installation Work. 5th ed. UK: Elsevier & Newnes Press.
6. T.Linsley. (2008). Electrical Installation Work – Tutor Support Material. 2nd ed. UK: Elsevier & Newnes Press.
7. Brian Scaddan. (2008). Electric Wiring: Domestic. 13th ed UK: Elsevier & Newnes Press.

DET212/3 CONTROL PRINCPLES (PRINSIP KAWALAN)

Synopsis

This course provides students with a background of control principles in various engineering applications. Throughout this course, students will learn the basic mathematical tools such as Laplace transform, transfer function, block diagram, signal flow graph, mathematical modeling of dynamic systems, time response analysis, stability of linear system, root locus and frequency domain analysis. The laboratory will be used to aid the students understanding of the concept introduced.

Course Outcome

CO1:
Able to demonstrate theoretical concepts of control systems
CO2:
Able to produce mathematical models from multiple subsystems (block diagrams/signal flow graphs) and from mechanical/electrical systems CO3: Able to evaluate stability for a given system using Routh-Hurwitz stability criterion
CO4:
Able to analyse system's time and frequency-domain with response to test inputs
CO5:
Able to produce a root locus plot and bode plot

References:

1. Norman S. Nise: Control System Engineering-7th ed, John Wiley & Sons, 2014.
2. Franklin G.F., Powerl J. D& Emami-Naeni A.: Feedback Control System-7th ed, Pearson Education, 2014.
3. Richard C. Dorf & Robert H. Bishop: Modern Control Systems-12th ed, Prentice Hall, 2010.
4. Ogata, Katsuhito: Modern Control Engineering-5th ed, Prentice Hall, 2009.
5. W.Bolton: Control Engineering-2nd ed, Prentice Hall, 1998.

DET214/3 PROGRAMMABLE LOGIC CONTROLLER (PENGAWALLOGIK BOLEH ATURCARA)

Synopsis

This course deals with the basic operation, application and programming industrial control system, concentrating on the industrial microprocessor programmable logic controller (PLC). The course covers historical background, uses of PLCs, product ranges, benefits numbering system codes and logic concepts pertaining to PLCs. The student will develop an understanding of the PLC central processing unit, input-output systems, programming and peripheral devices, and programming languages and will develop skills in programming and documenting on a cross section of industrial PLCs. Much time will be spend in the lab working on different kinds of industrial PLCs.

Course Outcome

CO1: Able to explain the types of components in an electrical controller.
CO2: Able to apply the basic concepts of PLC and its applications in industrial control application.
CO3: Able to construct a timer/counter and special instruction programming, editing and program observation.

References:

1. Frank D. Petruzella, Programmable Logic Controller, 5th Edition, McGRAW-HILL INTERNATIONAL, 2017.
2. Jon Stenerson, Fundamental of Programmable Logic Controllers, Sensors, and Communication, PEARSON-Prentice Hall, 2005.
3. Gary Dunning, Introduction to Programmable Logic Controller, 3rd Editions, THOMSONDELMAR LEARNING, 2006.
4. John W.Webb, Ronald A. Reis, Programmable Logic Controllers Principles and Applications, 5th Edition, Prentice Hall, 2002.

DET2183 ANALOGUE ELECTRONIC (ELEKTRONIK ANALOG)

Synopsis

This course introduces the application and analysis of Bipolar Junction Transistor (BJT) and Field Effect Transistor (FET) and the usage in amplifier as well as power amplifier circuit.

Course Outcome

CO1:
Able to differentiate between the classes of power amplifier
CO2:
Able to analyze the electrical characteristics of BJTs as multistage amplifiers
CO3:
Able to demonstrate the operation of BJTs and FETs with the circuit configurations as an amplifier

References:

1. Donald A. Neamen, Microelectronics Circuit Analysis and Design (2010), Fourth Edition, McGraw-Hill International Edition
2. Floyd, T.(2012). Electronic Devices: Conventional Current Version. Nineth Edition Englewood Cliffs, New Jersey : Prentice Hall.
3. Boylestad, R.L, and Nashelsky, L. (2013). Electronic Devices and Circuit Theory. Eleventh Edition : Prentice Hall
4. Robert T. Paynter, (2006). Introductory Electronic Devices and Circuits. Seventh Edition : Prentice Hall.

DET3083 POWER SYSTEM II (SISTEM KUASA II)

Synopsis

This course covers topics of introduction and basic analysis to economics of generations, transmission line modeling study, power system protection study and introduction to components of transmission & distribution system in Malaysia. This course intends to give the students fair knowledge about electrical power system which focuses on the following concepts: fundamental theory lectures, lab-intensive works in order to strengthen student's understanding and knowledge. At the end of this course, student should be complete one assignment on related topics.

Course Outcome

CO1:
Able to demonstrate theoretical concepts of economics of generations
CO2:
Able to analyze the short, medium and long line models of transmission line.
CO3:
Able to propose power system protection in electrical power system.
CO4:
Able to demonstrate components of transmission and distribution system.

References:

1. Glover, J. Duncan, "Power System Analysis & Design", 6nd Edition, Cengage Learning, 2016.
2. Glover, J. Duncan, "Power System Analysis & Design", 5nd Edition, Cengage Learning, 2012.
3. Hadi Saadat, "Power System Analysis", 3nd Edition, McGraw Hill, 2011.
4. DP. Kothari, "Modern Power System Analysis", 4rd Edition, Tata McGraw Hill, 2011.
5. Timothy L. Skvarenina, "Electrical Power and Controls", 2rd Ed, Prentice Hall, 2004.
6. S.J. Chapman, "Electric Machinery and Power System Fundamentals", McGraw Hill, 2002.

DET309/3 POWER ELECTRONICS (ELEKTRONIK KUASA)

Synopsis

This course introduces the students to the Power Electronics as a Multidisciplinary & Interdisciplinary Applications Orientated Technology emphasizing the main criterion of energy efficiency. AC-DC, AC-AC, DC- DC and DC-AC converter operation and performance, including waveform analysis, is developed from theoretical analysis, simulation and laboratories.

Course Outcome

CO1:
Able to explain power electronics system, devices and its applications
CO2:
Able to solve basic power computations in power electronics
CO3:
Able to analyze basic power electronics converter

References:

1. Daniel W. Hart (2011). Power Electronics. International ed. McGraw-Hill.
2. R. Shaffer. (2007). Fundamentals of Power Electronics with MATLAB. Charles River Media.
3. Muhammad H. Rashid. (2004). Power Electronics: Circuits, Devices & Applications.
4. 3rd ed. Prentice-Hall.
5. N. Mohan, T.M. Undeland, W.P. Robbins. (2003). Power Electronics: Converters, Applications & Design. 3rd ed. Wiley.
6. Cyril W. Lander. (1993). Power Electronics. 3rd ed. McGraw-Hill.

DET310/3 POWER SYSTEM COMMISSIONING AND MAINTENANCE PRACTICES (AMALAN PERTAULIAHAN & PENYELENGGARAAN SISTEM ELEKTRIK)

Synopsis

This course is to provide students with clear understanding of maintenance and commissioning practice of electrical power system equipment. It will cover both practical and theoretical information on the maintenance and testing of transformer, circuit breaker, protective relay and other electrical equipment. In practical session students will be divided to several groups to carry out laboratory experiments. Student will also gain knowledge regarding standard documentation, policy, investigation technique and data analysis prior to the commissioning. In addition, students will be exposed to standard apparatus and equipment used by utility for commencing maintenance and commissioning work.

Course Outcome

CO1:
Able to analyze primary and secondary parameter of distribution substation components
CO2:
Able to analyze commissioning and testing data
CO3:
Able to propose correct setting and parameter for testing equipment and power system components
CO4:
Able to apply electrical power system equipment testing

References:

1. S. Rao. (2004). Testing Commissioning Operation and Maintenance of Electrical Equipments. 6th ed. Khanna Publishers.
2. Abd. Samad Hanif. (2000). Pemasangan & Penyelenggaraan Elektrik. Kuala Lumpur: Dewan Bahasa & Pustaka.
3. K. Harker. (1998). Power System Commissioning & Practice. UK: IEE Power Series.
4. Paul Gill. (1998). Electrical Power Equipment Maintenance and Testing. USA: CRC Press Taylor & Francis Group.

DET3203 INDUSTRIAL SAFETY, QUALITY MANAGEMENT AND ETHICS (KESELAMATAN INDUSTRI, PENGURUSAN KUALITI DAN ETIKA)

Synopsis

This course gives an exposure to students to understand industrial safety standards and guidelines, quality management concept and various quality tools that allow students to understand the general picture of both areas which are being practiced by industries towards Industry 4.0. At the end of this course, students are expected to engage in ethics while working and able to identify suitable quality techniques and tools to be implemented in production management and can apply industrial safety standards in real industrial environment.

Course Outcome

CO1:
Able to explain fundamentals of industrial safety and quality management towards Industry 4.0
CO2:
Able to analyze the industrial hazards and electrical hazards
CO3:
Able to select suitable techniques and tools in quality management
CO4:
Able to demonstrate ethics in industrial safety and quality management

References:

1. David L. Goetsch, Occupational Safety and Health, for Technologists, Engineering, and Managers., 8th ed., Prentice Hall. 2015.
2. David L. Goetsch, Quality Management – Introduction to Total Quality Management for Production, Processing, and Services. 3rd Ed., Pearson Prantice Hall, 2011.

DET3513 SEMESTRAL PROJECT (PROJEK SEMESTRAL)

Synopsis

This course is a small-scale research projects for final year students and expected to complete within the same semester. The projects are based on solving the engineering problems by understanding the problems, troubleshooting, identify, solve and finally report writing for the documentation purposes. The projects are related to Electrical Power, Power Electronics, Instrumentation and Electronic based.

Course Outcome

CO1:
Able to identify solution based on problem study
CO2:
Able to design engineering solution utilizing an engineering practice
CO3:
Able to perform an engineering project
CO4:
Able to write a technical report and communicate in oral presentation

References:

- Semestral Project's Guideline for Diploma Engineering Programmes, UniMAP, 2008
- Any publish material such as writing, multimedia or personal communication that related to the project topics

PROGRAM KEJURUTERAAN

KOMPUTER

PROGRAM DIPLOMA KEJURUTERAAN KOMPUTER

Revolusi Industri Keempat (IR4.0) menyaksikan Objek Rangkaian Internet (IoT) dalam hampir semua aspek kehidupan seharian dan berbeza daripada revolusi industri pertama yang tertumpu kepada penggunaan mesin berkuasa wap, kedua kepada elektrik, dan ketiga kepada penggunaan teknologi maklumat (IT). IR4.0 ini membabitkan pelbagai bidang termasuk automasi, robotik, pengkomputeran awan, kecerdasan buatan (AI) dan internet untuk segala-galanya (IoT), di samping mengambil peluang dalam kemajuan bidang komunikasi. Ini akan menimbulkan permintaan yang besar untuk juruteknik/pembantu jurutera komputer. Untuk memenuhi permintaan ini, program Diploma Kejuruteraan (Kejuruteraan Komputer) disediakan untuk melahirkan tenaga kerja di peringkat ikhtisas yang mahir serta mempunyai pengetahuan yang kukuh dalam bidang Kejuruteraan Komputer.

Diploma Kejuruteraan (Kejuruteraan Komputer) berteraskan ilmu pengetahuan dalam bidang yang mengintegrasikan kejuruteraan elektronik dengan sains komputer untuk merekabentuk dan membangunkan sistem komputer, perisian dan pembangunan sistem operasi. Pengetahuan dan kemahiran dalam bidang seperti sistem terbenam (embedded system), rangkaian komputer dan intergrasi perisian dengan perkakasan turut disediakan. Para graduan juga diterapkan dengan budaya ilmu supaya mempunyai personaliti dan keperibadian yang unggul dan mampu berdikari sebagai pembantu jurutera yang efektif dan berpengetahuan dalam melaksanakan tugas.

Di akhir semester, para pelajar berpeluang melalui 6 bulan latihan industri sebagai persediaan dari segi mental dan intelektual berdasarkan apa yang telah dipelajari di dalam program ini dan juga untuk memberi suasana sebenar alam pekerjaan. Justeru itu, program ini dapat membentuk generasi berkenaan yang berupaya dan berkebolehan dalam mengaplikasi teknologi terkini dan sebagai penyumbang tenaga kerja terlatih dalam bidang elektronik dan komputer. Program ini direka khas bagi memenuhi keperluan industri seperti Intel, Agilent Technologies, Sony, HP, Motorola, Sapura, Celcom, Telekom Malaysia (TM), Inari Technology, SIRIM dan lain-lain lagi.

Di samping pekerjaan yang banyak ditawarkan kepada pelajar selepas tamat pengajian, pelajar juga berpeluang untuk menyambung pengajian mereka ke peringkat ijazah sarjana muda dan seterusnya ke peringkat ijazah tinggi di dalam bidang kejuruteraan elektronik dan elektrik, kejuruteraan komputer dan telekomunikasi sama ada di universiti tempatan ataupun di universiti luar negara.

Senarai kursus yang ditawarkan dalam struktur program Diploma Kejuruteraan Komputer :

- DKA104 /2 Matematik Awalan (Preliminary Mathematics)
- DKT111/3 Prinsip Litar Elektrik (Electric Circuits Principles)
- DKT113/3 Fizik Kejuruteraan (Engineering Physics)
- DKT121/3 Asas Pengaturcaraan Komputer (Fundamental of Computer Programming)
- DKT122/3 Sistem Digital I (Digital System 1)
- DKT123/3 Teknologi Elektrik (Electrical Technology)
- DKT124/3 Peranti Elektronik (Electronic Devices)
- DKT125/2 Pengatucaraan Berasaskan Objek (Object-Oriented Programming)
- DKT212/3 Sistem Digital II (Digital System II)
- DKT214/3 Litar Elektronik (Electronic Circuits)
- DKT215/3 Prinsip Isyarat dan Sistem (Signals and Systems Principles)
- DKT217/3 Sistem Komputer (Computer System)
- DKT221/3 Prinsip Sistem Pengoperasian (Operating System Principle)
- DKT223/3 Sistem Pangkalan Data (Database System)
- DKT224/3 Perhubungan Data dan Rangkaian (Data Communication and Network)
- DKT218/3 Mikropengawal (Microcontroller)
- DKT226/3 Asas Kejuruteraan Perhubungan (Basic Communication Engineering)
- DKT311/3 Kejuruteraan Perisisan (Software Engineering)
- DKT313/3 Sistem Kawalan (Control System)
- DKT316/3 Instrumentasi Elektronik (Electronics Instrumentation)
- DKT318/3 Keselamatan Industri, Pengurusan Kualiti dan Etika (Industrial Safety, Quality Management and Ethics)
- DKT351/3 Projek Semestral (Semestral Project)
- DIT361/6 Latihan Industri (Industrial Training)

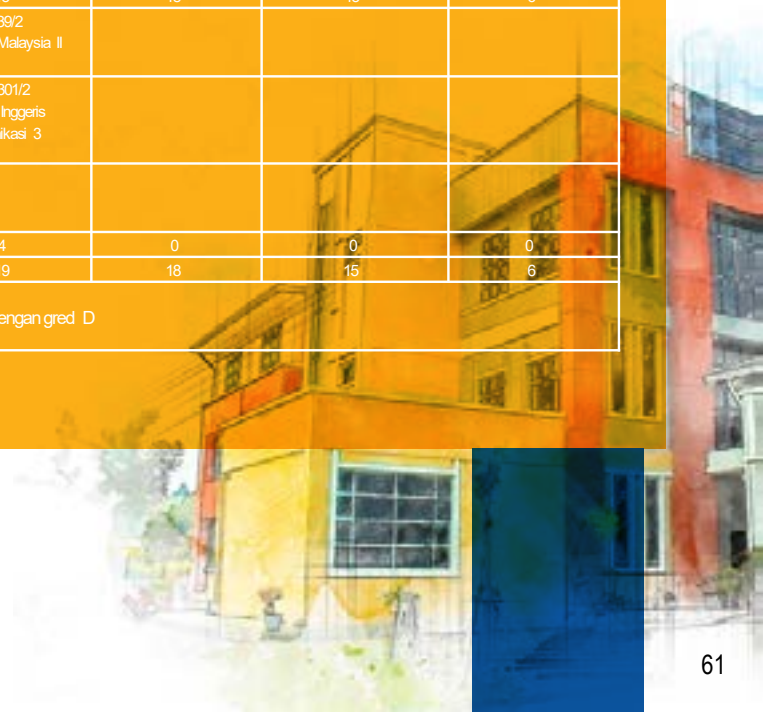
Antara peluang kerjaya yang berkaitan :

- Juruteknik/ Pembantu Jurutera Sistem Komputer dan Teknologi Maklumat
- Juruteknik/ Pembantu Jurutera Rekabentuk Sistem Terbenam
- Juruteknik/ Pembantu Jurutera Rangkaian (Rekabentuk)
- Juruteknik/ Pembantu Jurutera Elektronik
- Juruteknik/ Pembantu Jurutera Rangkaian Komputer
- Juruteknik/ Pembantu Jurutera Perkhidmatan Rangkaian Komputer
- Juruteknik/ Pembantu Jurutera Antara Muka
- Juruteknik/ Pembantu Jurutera Operasi Sistem Komputer
- Juruteknik/ Pembantu Jurutera Program Logik
- Juruteknik/ Pembantu Jurutera Semikonduktor
- Juruteknik / Pembantu Jurutera Telekomunikasi
- Pembantu Penyelidik

PROGRAM DIPLOMA KEJURUTERAAN KOMPUTER

TAHUN	PERTAMA		KEDUA		KETIGA	
SEMESTER	I	II	I	II	I	II
Kursus Teras Kejuruteraan (81)	DKA104/2 Matematik Awalan	DQT101/3 Matematik I	DQT102/3 Matematik II	DQT203/3 Matematik III	DKT311/3 Kejuruteraan Perisisan	DIT361/6 Latihan Industri
	DKT111/3 Prinsip Litar Elektrik	DKT122/3 Sistem Digital I	DKT212/3 Sistem Digital II	DKT217/3 Sistem Komputer	DKT313/3 Sistem Kawalan	
	DKT113/3 Fizik Kejuruteraan	DKT123/3 Teknologi Elektrik	DKT214/3 Litar Elektronik	DKT221/3 Prinsip Sistem Pengoperasian	DKT317/3 Instrumentasi Elektronik	
	DKT121/3 Asas Pengaturcaraan Komputer	DKT124/3 Peranti Elektronik	DKT215/3 Prinsip Isyarat dan Sistem	DKT223/3 Sistem Pangkalan Data	DKT318/3 Keselamatan Industri, Pengurusan Kualiti dan Etika	
	DCT100/2 Kemahiran Asas Kejuruteraan	DKT125/2 Pengatucaraan Berasaskan Objek	DKT218/3 Mikropengawal	DKT224/3 Perhubungan Data dan Rangkaian	DKT351/3 Projek Semestral	
	DUT123/2 IT dan Kemahiran Komunikasi			DKT226/3 Asas Kejuruteraan Perhubungan		
81	13	14	15	18	15	6
Kursus Kepentuan Universiti (14)	DVW410/2 Bahasa Melayu	DUW224/2 Keusahawanan Kejuruteraan	DUW239/2 Pengajian Malaysia II			
	DVW101/2 Bahasa Inggeris Komunikasi 1	DVW201/2 Bahasa Inggeris Komunikasi 2	DVW301/2 Bahasa Inggeris Komunikasi 3			
	DZWXXX/1 Badan Beruniform 1	DZWXXX/1 Badan Beruniform 2				
14	5	5	4	0	0	0
95	18	19	19	18	15	6

Note :
DKA104/ 2 Matematik Awalan : Prasyarat untuk Matematik Tambahan peringkat SPM dengan gred D



DKA104 Preliminary Mathematics

Synopsis

Mathematics is a required course of study in engineering programs diploma. This is due to the importance of mathematics as a tool in solving problems. This course is offered to master some basics mathematical knowledge and as a preparation for advance mathematics subjects which involve application in engineering.

Course Outcomes

CO1: Ability to express the concepts of trigonometry.
CO2: Ability to express relevant concepts and methods in algebra.
CO3: Ability to relate and apply the concepts and methods in calculus.CO4: Ability to apply the concepts of statistics and probability.

Reference

1. Stroud, K. A. "Engineering Mathematics", 7th. Ed. Palgrave MacMillan, 2013

DKT111 Electric Circuits Principles

Synopsis

This course covers introduction to the basic of electrical measurements, Ohm's Law, Series and Parallel Circuits, Circuit Theorems and Conversions and RLC circuits. This course will expose the students to the elements and principles of electrical circuit theory with appropriate to any RLC circuit applications.

Course Outcomes

CO1:
Able to demonstrate theoretical concepts of electrical current, voltage, resistance, capacitance and inductance.
CO2:
Able to apply the concept of series and parallel circuits, circuit theorems and Delta to Wye/Wye to Delta conversions.
CO3:
Able to determine solution for RLC circuits calculation related to electric circuits applications.

References

1. Thomas L. Floyd, "Principles of Electric Circuits: Conventional Current Version", 9th Edition, Pearson Prentice Hall, 2010
2. Charles Alexander and Sadiku, "Fundamentals of Electric Circuits", 6th Edition, McGraw-Hill, 2017

References

1. Nilsson and Riedel, "Electric Circuits", 10th Edition, Pearson Prentice Hall, 2015

DKT113 Engineering Physics

Synopsis

This course covers introduction to the physic and science which are force and motion, circular motion, work, power and energy, electrostatic, magnetism and electric current and resistance.This course will expose the students to the elements and principles of basic concepts of physics and its application.

Course Outcomes

CO1: Able to apply the standard unit, force and motion and their applications.
CO2: Able to support circular motion principles in oscillation and wave.
CO3: Able to apply the basics of electrostatic and electromagnetism.CO4: Able to examine electric current and resistivity.

References

1. Giambattista, Richardson, "College Physics" McGraw Hill International Ed., 2012
2. Randall D. Knight, Briant Jones, Stuart Field, "college Physics" Pearson, Third Edition, 2015.
3. Jerry Wilson, Anthny Buffa. "College Physics", 7th ed., Pearson Education, 2009, USA
4. Giambattista, Richardson, Richardson, "College Physics", McGraw Hill International Ed., 2007.
5. Stephen T. Thornton, Andrew Rex. "Modern Physics for Scientists & Engineers", 2nd ed, Brooks Cole, 1999.
6. W. Bolton." Engineering Science". Fourth Edition. Newnes. 2001

DKT121 Fundamental of Computer Programming

Synopsis

In this course, students learn computer system introduction, problem solving analysis and programming concept including variables, operator, control structure, function, array, file manipulation, structure and pointer.

Course Outcomes

CO1: Ability to describe and explain programming concept and principle.
CO2: Ability to Identify, demonstrate and design program using flowchart and pseudocode.
CO3: Ability to use LINUX environment for coding, compiling, executing and debugging computer software program.
CO4: Ability to propose solution for engineering related problems using computer programming techniques.

References

1. Deitel & Deitel, "C How To Program", 8th Ed, Pearson, 2015
2. Forouzan, B. A. & Gilberg R. F., "Computer Science: A Structured Programming Approach Using C" . 3rd Ed, Course Technology, 2006
3. Al Kelley, Ira Pohl, "C by Dissection: The Essentials of C Programming" 4th ed., Addison Wesley, 2000.

DKT122 Digital System 1

Synopsis

The subject will focus on the concept of electronics devices and electronic circuits design. This includes fundamentals of digital electronic circuits design through exposure of basic logic IC's and parallels digital simulation software. The course then develops students to appreciate simple digital applications such as basic counter, multiplexer and de-multiplexer circuits and the design these circuits using a basic logic IC's. Flip-flops and its basic application are introduces in the later part of the course and together with all the other disciplines mentioned earlier, students are expected to design a digital system (using basic logic IC's, LEDs and switches) and demonstrate their understanding.

Course Outcomes

CO1: Able to describe and explain the basic concept of numbering system.
CO2: Able to apply and analyze the basic logic for simple digital systems.
CO3: Able to design and demonstrate the combinational logic circuit system.

References

1. Thomas L. Floyd : Digital Fundamentals -11th ed, PEARSON, 2015
2. M. Morris Mano, Charles R. Kime : Logic and Computer Design Fundamentals-4th ed, Pearson Education, 2014.

DKT123 Electrical Technology

Synopsis

This subject will expose the student to AC circuit, electromagnetic, basic transformer and electrical machines. The topics cover AC analysis including series and parallel circuits, three phase system and magnetic coupled circuit. Student will also gain more knowledge on electromagnetism, transformers, DC machines and AC machines. General concept and basic principle of operation for each electrical machine are covered which include the characteristic and performance analysis.

Course Outcomes

CO1: Able to describe and explain the concept of magnetism and electromagnetism.
CO2: Able to apply application of electrical transformer.
CO3: Able to apply the concept of three-phase system and basic magnetic circuit.
CO4: Able to construct the operation and apply the application of DC machine and AC machines.

References

1. Chapman S.J., "Electric Machinery Fundamentals", Fifth Edition, 2011, McGraw Hill.
2. Thomas L. Floyd, "Electric Circuit Fundamentals", 7th Ed, Pearson/Prentice Hall, c2007.
3. Alexander and Sadiku. "Fundamentals Of Electric Circuits", Fifth Edition, McGraw-Hill.

DKT124 Electronic Devices

Synopsis

This course is designed to provide and exposes students with fundamentals and application of basics electronic device. The course also includes introduction to semiconductor, diode application, BJT, BJT Biasing and Field Effect Transistor (FET). Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes

CO1: Able to apply and solve theory of semiconductor materials and diode operation
CO2: Able to analyze and calculate diode applications
CO3: Able to justify Bipolar Junction Transistor (BJT) operation and biasing
CO4: Able to apply Field Effect Transistor (FET) operation and biasing.

References

1. Boystead, R.L., Nashelky, L."Electronic Device and Circuit Theory", 12th Edition,Prentice Hall, 2016.
2. Hambley, A.R. "Á Top-down Approach to Computer Aided Circuit Design",MacMillan,1994.
3. Thomas L. Floyd, "Electronic Devices"(Conventional Current Version),8/E. Prentice Hall, 2007
4. Ahmad Radzi Mat Isa, Yaacob Mat Daud, Roslinda Zainal, "Electronik Asas Peranti Semikonduktor", ISBN 983-52-0419-5, 2007.
5. Floyd, T."Electronic Devices",9 th Edition, Prentice Hall 2012.

DKT125 Object-Oriented Programming

Synopsis

This course covers introduction to the object oriented programming concept. The course details on the applying and developing an object oriented program and able to analyse application development of Graphical User Interface (GUI) using object oriented concept.

Course Outcomes

CO1: Able to demonstrate object oriented programming concept.
CO2: Able to create object oriented programming application in software development.
CO3: Able to analyze application development using OOP based Graphical User Interface (GUI) library.

References

1. D.S Malik(2013). C++ Programming: From Problem Analysis to Design Problem, 6th Edition, Cengage Learning.
2. Bjarne Stroustrup (2013). Programming -- Principles and Practice Using C++, 4th Edition, Addison-Wesley
3. Kathy Sierra, Bert Bates. (2005). Head First Java, 2nd Edition. O'Reilly Media, Inc.
4. Ralph Morelli, Ralph Walde. (2006). Java Java Java, Object Oriented Problem Solving. 3rd Edition. Pearson-Prentice Hall.

DKT212 Digital System II

Synopsis

This course expose the students to the applications of Combinational and Sequential Logic System, particularly in shift register and counter design. The course also includes Introduction to Sequencing and Control which will guide the students for subjects that will taken in later semesters.

Course Outcomes

CO1: Able to describe the theories of basic storage devices and fundamental operations of sequential circuit application.
CO2: Able to construct counters using transition tables and counter application using finite state machine and register transfer language.
CO3: Able to develop sequential circuit using CAD tools and program onto hardware.

References

1. Floyd, Thomas L., "Digital Fundamentals", 11th Edition by Pearson 2015
2. M. Morris Mano, Charles R. Kime, "Logic and Computer Design Fundamentals", 4th Edition by Pearson 2007
3. Ronald J. Tocci, Neal S. Widmer and Gregory L. Moss, "Digital Systems: Prinsiples and Applications", 10th Edition by Prentice Hall 2006
4. Floyd, Thomas L., "Digital Fundamentals", 9th Edition by Prentice Hall 2006
5. Mohamed Rafiquzzaman, "Fundamentals of digital logic and microcomputer design", Hoboken, J. Wiley & Sons, 2005

DKT214 Electronic Circuits

Synopsis

This course covers introduction to Operational Amplifier, common Op-amp circuitry, active filtering, voltage regulating and voltage oscillating circuits using Op-amps. This course will expose the students to the elements and principles of electronic circuitry, advantages and analysis of Op-amp circuitry to determine responses for practical applications.

Course Outcomes

CO1: Able to describe the basic op-amp characteristics, parameters and configurations.
CO2: Able to apply the concept of negative feedback, its limitations and usage in practical circuitry.
CO3: Able to construct op-amp circuitry related to electronic circuits applications.

References

1. Floyd, Thomas L., Electronic Devices: Conventional Current Version. 9th ed., New International edition, Pearson Education, 2014.
2. Boylestad, Robert L., and Louis. Nashelsky, Electronic Devices and Circuit Theory. 11th ed., Pearson Prentice Hall, 2013.
3. Bogart, Theodore F., Jeffrey S. Beasley, and Guillermo. Rico, Electronic Devices and Circuits. 6th ed., Pearson Prentice Hall, 2004.
4. Aminian, Ali., and Marian K. Kazimierczuk. Electronic Devices: A Design Approach. Upper Saddle River, N.J.: Pearson Prentice Hall, 2004
5. Diffenderfer, Robert. Electronic Devices: Systems and Applications. Cliftork, N.Y.: Thom Delmar Learning, 2005.

DKT215 Signals and Systems Principles

Synopsis

This course is designed to expose students to types of signals, operations of signals and systems. Specifically, this subject covers analysis of signals in time domain and frequency domain representation, operation of signals and transformations of signals in s-domain and also the properties of a Linear Time Invariant system.

Course Outcomes

CO1: Able to demonstrate types, characteristics and waveforms of the signals, perform operations of signals and the properties of a system.
CO2: Able to analyze properties of LTI system, including time-domain signals and frequency domain representation of signals.
CO3: Able to calculate transformation from time domain to s-domain and analyze system transfer function.
CO4: Able to construct signal transformations and analyze system transfer functions using related software.

References

1. CAlan V. Oppenheim, Alan S. Willsky, S. Hamid Nawab "Signals and Systems", 2nd. Ed., Pearson, 2013
2. Simon Haykin, Barry Van Veen "Signals and Systems", 2nd. Ed., Wiley, 2005.
3. Charles L. Philips, John M. Parr, Eve A. Riskin, "Signals, Systems and Transforms", 3rd Ed., Prentice Hall International Edition, 2003.

DKT218 Microcontroller

Synopsis

The aim of this course is to study the Intel 8051 Microcontroller architecture and relate that knowledge to the design of microcontroller based systems. This includes the design technique using internal I/O interfacing, internal memory and introduction to interrupt configuration for the systems. The study of 8051 instruction set and various software development tools are also emphasized as the knowledge are needed in the designing of controller-based systems.

Course Outcomes

CO1: Able to explain the basic theories of microcontroller architecture and operations.
CO2: Able to write the assembly language for basic microcontroller operations.
CO3: Able to develop a simple microcontroller based application project.

References

1. Muhammad Ali Mazidi, Rolin D. McKinlay, Janice G. Mazidi, "The 8051 Microcontroller: A Systems Approach", Pearson, 2013
2. I. Scott MacKenzie, Raphael C. W. Phan, "The 8051 Microcontroller", 4th Edition, Prentice Hall, 2007
3. Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay, "The 8051 Microcontroller and Embedded Systems Using Assembly and C", 2nd Edition, Prentice Hall, 2006

DKT217 Computer System

Sinopsis

This subject is focused on the computer system organization and architecture which includes the internal architecture, organization and interface techniques of a central processing unit (CPU). The syllabus covers the theory of a basic computer system, format of the instruction set and memory organization. The laboratory are procedures for students to develop and simulate a basic CPU using the Very High Speed Hardware Description Language (VHDL) using appropriate Computer Aided Design (CAD) tools.

Course Outcomes

CO1: Able to explain the fundamental development of modern day computers and the central processing unit.
CO2: Able to illustrate and derive the organization and architecture concepts for a central processing unit (CPU).
CO3: Able to write VHDL codings and develop basic FPGA based systems

References

1. William Stallings. (2016). Computer Organization and Architecture, 10th Edition, Pearson
2. Carl Hamacher, Zvonko Vranesic, Safwat Zaky. (2012). Computer Organization, 6th Edition, McGraw Hill
3. John P Hayes. (2005). Computer Architecture and Organization, 3rd Edition, McGraw-Hill

DKT221 Operating System Principle

This course introduces the fundamentals of operating systems. Topics include interprocess communication, process scheduling, deadlock, memory management, virtual memory, and file system. Formal principles are illustrated with examples and case studies of one or more contemporary operating system.

Course Outcomes

CO1: Able to define and explain the major concepts which builds up an operating system
CO2: Able to write a program in GNU/Linux operating system for coding, compile, execute and test C programming in simulating issues in Operating System.
CO3: Able to describe the processes, file management, processor scheduler and memory management

References

1. Stallings, W. 2016. Operating Systems: Internals and Design Principles, 9th Edition.
Prentice-Hall.
2. Mark G. Sobell 2014. A Practical Guide to Linux Commands, Editor's, And Shell Programming. 2nd Ed. Prentice Hall
3. William Shay. (2015). An Introduction to Operating Systems. 2nd Ed. Prentice Hall

DKT223 Database System

Synopsis

The subject will focus on the concept of database system and architecture. This includes data models, schemas and instances and system environment. Students will be exposed with data modeling by using high level conceptual data models for database design. The course will also cover relational model database which contains concepts, constrains, normalization, languages design including SQL programming techniques, practical database, design methodology and use of UML diagrams.

Course Outcomes

CO1: Able to explain the concept of database system and the purpose and use of database management system.
CO2: Able to write SQL program and recognize types of SQL statement.
CO3: Able to normalize and administrate a relational database
CO4: Able to design conceptual models of an application domain for database applications

References

1. Elmasri&Narathe. (2017) Fundamentals of Database Systems, 7th Ed. Pearson Addison Wesley
2. Elmasri&Narathe. (2007) Fundamentals of Database Systems, 5th Ed. Pearson Addison Wesley
3. Thomas Connolly, Carolyn Begg and Anne Strachan,(2005).Database Systems, 4th Ed. Addison-Wesley
4. James Perry&Gerald Post, (2007) Introduction to ORACLE 10g. 1st Ed. Pearson Prentice Hall
5. Jeffrey A Hoffer, Mary B Prescott & Fred R McFadden, (2007), Modern Database Management, 8th Edition, Pearson
6. John Garmany, Jeff Walker, Terry Clark, (2005), Logical Database Design Principles, Auerbach Publication

DKT224 Data Communication and Network

Synopsis

This course is to discuss the fundamental concepts of data communication and network, emphasized on application of concept architecture and layer, signal transmission technique, network topologies and connectivity devices. It also discuss on multiplexing as well as to give exposure of network.

Course Outcomes

CO1: Able to explain the theory and basic of data communication and network.
CO2: Able to evaluate application of network connection concept and protocol used.
CO3: Able to classify the data communication network equipments and instruments.
CO4: Able to construct the network setup and perform troubleshooting in group.

References

1. Behrouz A. Forouzan, "Data Communications and Networking", 5th Edition, McGraw Hill, 2012
2. William Stalling, "Data and Computer Communications", 10th Edition, Prentice Hall, 2013
3. Massoud Moussavi, "Data Communication and Networking: A Practical Approach, Delmar Cengage Learning, 20

DKT226 Basic Communication Engineering

Synopsis

This course introduces the students with the basic communications systems including parameters, basic elements, modems and noise. The knowledge gained will contribute in understanding the operation of the related circuit. The exposures in amplitude modulations and frequency modulations will help the most in understanding the real applications. The introduction of digital communications will enhance the students understanding about the revolution of communications and latest technology.

Course Outcomes

CO1: Able to define and explain the principles of basic communication systems.
CO2: Able to describe the analog & digital modulation and the effect of SNR parameter.
CO3: Able to construct the AM & FM outputs and solve the calculations of AM & FM circuits.
CO4: Able to apply the concept of digital communications technology.

References

1. Wayne Tomasi," Electronic Communication System, Fundamental Through Advanced",5th Ed. Pearson, Prentice Hall, 2004
2. Haykin, S. S.; Moher, M. Communication Systems, 5th ed., International student ed.; John Wiley: Hoboken, N.J., 2010
3. Couch, L. W. Digital and Analog Communication Systems, 7th ed.; Prentice Hall International Editions; Pearson/Prentice Hall: Upper Saddle River, N.J., 2007.
4. Young, P.H. Electronic Communication Techniques, 5th ed.; Pearson/ Prentice Hall: Upper Saddle River, N.J., 2004.

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5. Mullet, G.J. Basic Telecommunications : The Physical Layer; Thomson/ Delmar Learning: Australia, 2003.

DKT311 Software Engineering

Synopsis

The subject will focus on the concept of software engineering process and management. This includes on how to manage the project which concern on the critical system, economic and human consequences. The course will also cover the processes, techniques and deliverables that are associated with engineering requirement. This will include discussion of software requirement, system modelling, formal specification and techniques for specifying dependability. This course will also emphasize on the techniques for software verification and validation includes testing and critical system validation, process improvement and configuration management.

Course Outcomes

CO1: Able to describe the software engineering terms and concepts.
CO2: Able to demonstrate the software processes management, validation and verification.
CO3: Able to assess the problem based on software engineering process models and specification document.
CO4: Able to propose solution for engineering problem related to the software engineering techniques.

References

1. Ian Sommerville, "Software Engineering", 10th Edition, Pearson,2015
2. Roger S. Pressman, "Software Engineering: A Practitioner's Approach",

8th Edition, McGraw Hill, 2014
3. Carlo Ghezzi, Mehdi Jayazeri, Dino Mandriaolli, "Fundamental of Software Engineering, 2nd Edition, Prentice Hall, 2002

DKT313 Control System

Synopsis

This course provides students with a background of control principles in various engineering applications. Throughout this course, students will learn the basic mathematical tools such as Laplace transform, transfer function, block diagram, signal flow graph, mathematical modeling of dynamic systems, time response analysis, stability of linear system, root locus and frequency domain analysis. The laboratory will be used to aid the students understanding of the concept introduced.

Course Outcomes

CO1: Able to demonstrate theoretical concepts of control systems.
CO2: Able to produce mathematical models from multiple subsystems (block diagrams/signal flow graphs) and from mechanical/electrical systems.
CO3: Able to evaluate stability for a given system using Routh-Hurwitz stability criterion.
CO4: Able to analyse system's time and frequency-domain with response to test inputs.
CO5: Able to produce a root locus plot and bode plot.

References

1. Norman S. Nise: Control System Engineering-7th ed, John Wiley & Sons, 2014.
2. Franklin G.F., Power J. D& Emami-Naeni A: Feedback Control System-7th ed, Pearson Education, 2014.
3. Richard C. Dorf & Robert H. Bishop: Modern Control Systems-12th ed, Prentice Hall, 2010.
4. Ogata, Katsuhito: Modern Control Engineering-5th ed, Prentice Hall, 2009.
5. W.Bolton: Control Engineering-2nd ed, Prentice Hall, 1998.

DKT317 Electronics Instrumentation

Synopsis

In this course, students will be introduced to IoT hardware design, IoT systems integration, sensors and actuator controls, IoT device integration to network communications and cloud computing. The course would also cover security topics regarding IoT implementation and authentication protocols. Reliability perspective in IoT architecture will also be discussed together with privacy and ethics regarding IoT implementation in real life data gathering.

Course Outcomes

CO1: Able to explain the basic concepts of sensors and actuators.
CO2: Able to interface and synthesize input-output signals using external interfaces on IoT devices.
CO3: Able to design and integrate Internet of Things solution to the Internet.

References

1. Rajkumar Buyya and Amir Vahid Dastjerdi, "Internet of Things: Principles and Paradigms", 1st Edition, Morgan Kaufmann, 2016.
2. Donald Norris, "The Internet of Things: Do-It-Yourself at Home Projects for Arduino, Raspberry Pi and BeagleBone Black", McGraw Hill Education, 2016.
3. Peter Waher, "Learning Internet of Things", 1st Edition, Packt Publishing Ltd., 2015.

DKT318 Industrial Safety, Quality Management and Ethics

Synopsis

This course gives an exposure to students to understand industrial safety standards and guidelines, quality management concept and various quality tools that allow students to understand the general picture of both areas which are being practiced by industries towards Industry 4.0. At the end of this course, students are expected to engage in ethics while working and able to identify suitable quality techniques and tools to be implemented in production management and can apply industrial safety standards in real industrial environment.

Course Outcomes

CO1: Able to explain fundamentals of industrial safety and quality management towards Industry 4.0. CO2: Able to analyze the industrial hazards and electrical hazards.

CO3: Able to select suitable techniques and tools in quality management.
CO4: Able to demonstrate ethics in industrial safety and quality management.

References

1. David L. Goetsch, Quality Management – Introduction to Total Quality Management for Production, Processing, and Services. 5th Ed., Pearson Prantice Hall, 2006.
2. Jay Heizer, Barry Render, Operations Management. 9th Ed., Pearson Education 2008.
3. Charles D. Reese, Industrial Safety and Health for Infrastructure Services. CRC Press. 2009.
4. C. Ray Asfahl, Industrial Safety and Health Management, 5th Ed., Pearson Prantice Hall, 2003.
5. David L. Goetsch, Occupational Safety and Health, for Technologists, Engineering, and Managers., 4th ed., Prentice Hall. 2002.
6. Willie Hammer, Dennis Price, Occupational Safety Management and Engineering., 5th ed., Prentice Hall. 2001.
7. Howard S. Gitlow et. al, Quality Management, 3rd ed., McGraw-Hill. 2005

DKT351 Semestral Project

Synopsis

The Semestral Project is a small-scale design and applied projects for final year diploma students and expected to complete within one semester. The projects based in solving engineering problems by problems understanding, troubleshooting, identify, solving, and report writing. The projects cover electronics circuits, digital logics design, embedded and microprocessor system interfacing, PLC programming, computer system and software development.

Course Outcomes

CO1: Able to identify solution based on problem study.
CO2: Able to design engineering solution utilizing an engineering practice.
CO3: Able to perform an engineering project.
CO4: Able to write a technical report and communicate in oral presentation.

References

1. Semestral Project's Guideline for Diploma Engineering Programmes, UniMAP, 2008
2. Any publish material such as writing, multimedia or personal communication that related to the project topics

PROGRAM KEJURUTERAAN

ELEKTRONIK

PROGRAM DIPLOMA KEJURUTERAAN ELEKTRONIK

PENGENALAN

Program Diploma Kejuruteraan diharapkan dapat melahirkan tenaga mahir sebagai Pembantu Jurutera bagi memenuhi keperluan guna tenaga negara terutama dalam bidang elektronik. Oleh itu program yang dibangunkan akan sentiasa diperhalusi secara berterusan dengan:

- Mengambilkira pandangan dan kesimpulan hasil-hasil kajian serta maklumbalas dari masyarakat, khususnya industri.
- Memenuhi kehendak-kehendak badan-badan penasihat profesional yang berkaitan seperti Jabatan Perkhidmatan Awam (Bahagian Jaminan Kualiti &Akreditasi).
- Memastikan keseimbangan antara kepakaran teori dan kemahiran amali.
- Memastikan tahap pengajaran dan pembelajaran sentiasa bertaraf dunia.

PROGRAM YANG DITAWARKAN:

- Diploma Kejuruteraan Elektronik

PELUANG KERJAYA

Graduan lulusan Diploma Kejuruteraan Elektronik mempunyai prospek pekerjaan yang luas, sama ada dalam syarikat swasta, industri, jabatan kerajaan dan badan-badan berkanun. Bidang kerjaya untuk graduan antaranya:

- Industri Perkilangan (Proses, Penyelenggaraan dan Kumpulan SokonganTeknikal)
- Kejuruteraan
- Jaminan Kualiti atau Kawalan Kualiti
- Keboleharapan
- Analisa Kegagalan
- Pencirian Peranti dan Pengujian Antara kerjaya berkaitan bagi graduan Diploma Kejuruteraan Elektronik
- Juruteknik.
- Pembantu Jurutera.
- Pembantu Pegawai Latihan Vokasional

PROGRAM DIPLOMA KEJURUTERAAN ELEKTRONIK

TAHUN	PERTAMA		KEDUA		KETIGA	
SEMESTER	I	II	III	IV	V	VI
Kursus Teras Kejuruteraan (81)	DKA104/2 Matematik Awalan	DQT101/3 Matematik I	DQT102/3 Matematik II	DQT203/3 Matematik III	DMT351/3 Projek Semestral	DIT361/6 Latihan Industri
	DMT114/2 Sains Kejuruteraan	DMT121/3 Peranti Elektronik	DMT231/3 Elektronik Analog	DMT241/3 Pengantar Bentangan Litar Terkamir	DMT352/3 Instrumentasi Elektronik	
	DMT112/3 Teori Litar I	DMT122/3 Teori Litar II	DMT232/3 Asas Mesin Elektrik	DMT242/3 Fabrikasi Wafer	DMT353/3 Pengenalan Kepada Pengawal Aturcara Logik	
	DCT100/2 Kemahiran Asas Kejuruteraan	DMT124/3 Asas Digit I	DMT233/3 Asas Digit II	DMT243/3 Pembungkusa n Elektronik	DMT354/3 Pengenalan Kepada Sistem Kawalan	
	DMT113/2 Lukisan Kejuruteraan	DMT125/2 Sains Bahan	DMT234/3 Pengenalan Kepada Semikonduktor Fizik dan Peranti	DMT244/3 Analisis Kegagalan		
	DMT123/3 Pengenalan Kepada Pengaturcaraan Komputer	DMT126/2 Keselamatan, Kualiti dan Etika di Industri		DMT245/3 Pengenalan Kepada Mikropengawal		
	DUT123/2 IT dan Kemahiran Komunikasi					
81	14	16	15	18	12	6
Kursus Kepentuan Universiti (14)	DWW410/2 Bahasa Melayu	DWW201/2 Bahasa Inggeris Komunikasi 2	DWW301/2 Bahasa Inggeris Komunikasi 3	DUW224/2 Keusahawana n Kejuruteraan	DUW239/2 Pengajian Malaysia II	
	DWW101/2 Bahasa Inggeris Komunikasi 1	DZWXXX/1 Badan Beruniform 2				
	DZWXXX/1 Badan Beruniform 1					
14	5	3	4	0	2	
95	19	19	19	18	14	6

Note:
DKA104/2 Matematik Awalan : Prasyarat untuk Matematik Tambahan peringkat SPM dengan gred D

DKA104 Preliminary Mathematics

Synopsis

Mathematics is a required course of study in engineering programs diploma. This is due to the importance of mathematics as a tool in solving problems. This course is offered to master some basics mathematical knowledge and as a preparation for advance mathematics subjects which involve application in engineering.

Course Outcomes

CO1: Ability to express the concepts of trigonometry.
CO2: Ability to express relevant concepts and methods in algebra.
CO3: Ability to relate and apply the concepts and methods in calculus.
CO4: Ability to apply the concepts of statistics and probability.

References

1. Stroud, K. A. "Engineering Mathematics", 7th. Ed. Palgrave MacMillan, 2013.

DMT112 Circuit Theory I

Synopsis

This course will introduces the students fundamentals of DC Circuits, laws and theorems. It will cover in series, parallel and series-parallel circuits includes Ohm's Law, Kirchhoff voltage and current Law, Voltage and Current Divider Rule. Network theorems includes delta to wye and wye to delta conversion, Nodal Analysis, Mesh Analysis, source transformations, superposition, maximum power transfer, Thevenin's and Norton's theorem. Students also will be exposed concepts for balance three phase system.

Course Outcomes

CO1: Able to explain the basic circuit elements, method of circuit analysis, network theorem, and capacitance inductance initial and steady state condition.
CO2: Able to solve circuit's problems using series and parallel equivalents, using Ohm's Law, method of circuit analysis and network theorem in DC electric circuit.
CO3: Able to rearrange and simplify circuits using application of series and parallel equivalents, method of circuit analysis and network theorem along with Ohm's Law.

References

1. Charles K. Alexander & Mathew Sadiku, Fundamentals of Electric Circuit. 6th Edition, McGraw-Hill, 2016.
2. Richard C. Dorf & James A. Svoboda, Introduction to Electric Circuits. 9th Edition, John Wiley & Sons, 2013.
3. J. David Irwin & Chwan-Hwa Wu, Basic Engineering Circuit Analysis, 11th Edition, John Wiley & Sons, 2015.
4. Clayton R. Paul & Charles Paul, Fundamentals of Electric Circuit Analysis. John Wiley & Sons, 2001.
5. Johnson, D.E. Johnson, J.R. & Hilburn, J.L. Basic Electric Circuit Analysis. 5th Edition, Prentice Hall, 1999.

DMT113 Engineering Drawing

Synopsis

The aim for this course is to give exposure and skills for the Diploma Engineering students the basic of engineering drawing knowledge and its application in engineering, mainly with the manual drawing skills and the skills of using Computer Aided Drafting (AutoCAD) software. This course comprises of basic engineering drawing concepts such as geometry drawings, dimensions and AutoCAD basic drawings.

Course Outcomes

CO1: Able to identify tools and drawing technique in engineering drawing.
CO2: Able to use traditional tools and CAD to draw lines, circles, arcs, and curves.
CO3: Able to construct the geometry drawings using hand tools and CAD.
CO4: Able to illustrate the multiview, axonometric and oblique drawings using hand tools and CAD.

References

1. Frederick E. Giesecke, Henry Cecil Spencer, John Thomas Dygdon, Alva Mitchell, Ivan Leroy Hill, James E. Novak., Technical Drawing 12th Edition, Prentice Hall/ Pearson Education., 2003.
2. Mark Dix, Paul Riley, Discovering AutoCAD 2007, Pearson/ Prentice Hall., 2007.
3. M. Ramzan Mainal, Badri Abdul Ghani, Yahya Samian, Lukisan Kejuruteraan Asas 2nd Edition, Cetakan Keenam, Universiti Teknologi Malaysia (UTM)., 2000.
4. Khairul Anwar Hanafiah, Lukisan Kejuruteraan Berbantu Komputer 2nd Edition, UTMSkudai,. 2006.

DMT114 Engineering Science

Synopsis

The purpose of this course is to give the knowledge for student about science and engineering that involve physicals and sciences phenomena, which is the basic for engineering. Theories, principles and standard units have been focused for every syllabus so that the student could understand fully about this course.

Course Outcomes

CO1: Able to apply principle concepts of science.
CO2: Able to compare the principle concepts of sciences in engineering.
CO3: Able to support principle concepts of science in engineering applications.

References

1. Jerry Wilson, Anthony Buffa. "College Physics", 7th ed., Pearson Education, 2009,USA
2. Giambattista, Richardson,Richardson, "College Physics", McGraw Hill Internationatial Ed., 2007.
3. Stephen T.Thornton, Andrew Rex, "Modern Physics for Scientists & Engineers", 2nded, Brooks Cole, 1999.
4. W.Bolton, "Engineering Science". Fourth Edition, Newnes, 2001.

DMT121 Electronic Devices

Synopsis

This course introduces basic semiconductor devices such as diode, Bipolar Junction Transistor (BJT) and Field-Effect Transistor (FET) theories. The syllabus consists of:
- understanding the principles and operation of semiconductor devices.
- investigates the applications of these devices.
- solving BJT and FET parameters using various types of biasing.

Course Outcomes

CO1: Able to explain theories of electronic devices.
CO2: Able to demonstrate applications of electronic devices.
CO3: Able to develop operations of electronic devices.

References

1. Floyd. T.L., "Electronic Devices", 9th edition, Pearson, 2013.
2. Boystead, R.L. & Nashelsky, L., "Electronic Devices and Circuit Theory", 10th edition, Prentice Hall, 2009.
3. Cathey, J.J, "Schaum's outline of theory and problems of electronics devices and circuits", 4th edition, McGraw-Hill, 2000

DMT122 Circuit Theory II

Synopsis

This course will introduce the students to the AC circuit, methods of circuit analysis and network theorems. Students also will be exposed to the AC power analysis, the resonant circuit and parameters related to the frequency response and lastly to two port networks.

Course Outcomes

CO1: Able to explain the electrical component in AC circuit.
CO2: Able to solve circuit's problem using series and parallel equivalents, Ohm's Law, method of circuit analysis and network theorem in AC electric circuit.
CO3: Able to construct the resonance circuit, balance three phase system and two port networks.

References

1. Charles K. Alexander & Mathew Sadiku, Fundamentals of Electric Circuit. 5th Edition, McGraw-Hill, 2013.
2. Richard C. Dorf & James A. Svoboda, Introduction to Electric Circuits. 8th Edition, John Wiley & Sons, 2011.
3. J. David Irwin & Chwan-Hwa Wu, Basic Engineering Circuit Analysis. 10th Edition, John Wiley & Sons, 2011.
4. Clayton R. Paul & Charles Paul, Fundamentals of Electric Circuit Analysis. John Wiley & Sons, 2001.
5. Johnson, D.E. Johnson, J.R. & Hilburn, J.L. Basic Electric Circuit Analysis. 5th Edition, Prentice Hall, 1999.

DMT123 Introduction to Computer Programming

Synopsis

C is one the most popular programming languages used in engineering and science. This course is designed to teach students how to solve engineering and science problem using the C programming language.

Students will be exposed to the basic structures of computer, and the coding techniques used in C programming. Started with introduction to C programming, students then will learn about conditional statements, loops, functions, pointers, files operations, arrays and multi-dimensional

Course Outcomes

CO1: Able to sketch flowchart to solve engineering and science problems.
CO2: Able to write C program for conditional statements, loops and functions.
CO3: Able to construct dynamic data structures using arrays, pointers and file operations.

References :

1. Detel & Deitel, Suhizaz Sudin, R. Badlishah, Yasmin Yacob "C How to Program", Pearson-Prentice Hall 2006.
2. Harry H. Cheng, "C for Engineers and Scientists, An Interpretive Approach", McGraw Hill Education Europe, 2010.
3. Jerry R. Hanly & Elliot B. Koffman "C Program Design for Engineers", Addison-Wesley, 2001.
4. Tan & D Orazio "C Programming for Engineering & Computer Science", Mc Graw Hill, 1999.
5. Forouzan, B. A. & Gilberg R. F., "Computer Science: A Structured Programming Approach using C" Cengage Learning, Inc 2007.

DMT124 Digital Fundamental I

Synopsis

This course provides students an exposure to logic design, particularly combinational logic functions. The students are expected to demonstrate their function design using fixed-function logic ICs.

Course Outcomes

CO1: Able to describe the concepts and principles of logic design.
CO2: Able to construct combinational logic design using logic simplifications and circuit transformation.
CO3: Able to design combinational logic functions.

References

1. T.L. Floyd, "Digital Fundamentals", 11th Edition, Prentice Hall, 2015.
2. R.H. Katz and G. Borriello, "Contemporary Logic Design", 2nd Edition, Prentice Hall, 2006
3. R.J. Tocci, N. S. Widmer and G.L. Moss, "Digital Systems: Principles and Applications", 11th Edition, Prentice Hall, 2011.
4. Dale R. Patrick, Stephen W. Fardo, Vigyan Chandra "Electronic Digital System Fundamentals", 2008
5. Thomas L. Floyd " Digital Fundamentals with VHDL", 2003

DMT125 Materials Science

Synopsis

This course aims to give students a general introduction to materials properties. The subject will cover measurement of the properties, class of materials properties and fundamental knowledge to make material selection with better properties. The common micro-structural features of different materials classes will be outlined in order to relate with its process as well as performance.

Courses Outcomes

CO1: Able to compare types of materials and describe their structure and properties.
CO2: Able to analyse the nature and structure of an atom and distinguish between crystalline and non-crystalline materials.
CO3: Able to investigate mechanical and electrical properties of various materials.

References

1. William F. Smith, Javad Hashemi, "Foundations of Materials Science & Engineering", 5th ed, McGraw Hill, 2010
2. Ashby, M. and Jones, D.R.H. (2011). Engineering Materials I: An Introduction to Properties, Applications, and Design, 4th Edition, Elsevier, Butterworth Heinemann.
3. Ashby, M. and Jones, D.R.H. (2012). Engineering Materials II: An Introduction to Microstructure, processing, and design, 4th Edition, Elsevier, Butterworth Heinemann.
4. Sharma, C.P. (2004). Engineering material properties and applications of metal and alloys, Prentice Hall, New Delhi.
5. Rajput, R.K. (2000). Engineering Materials. S.Chand & Company, New Delhi.

DMT126 Safety, Quality and Ethics in Industry

Synopsis

This course gives an exposure to students to understand industrial safety standards and guidelines, quality management concept and various quality tools that allow students to understand the general picture of both areas which are being practiced by industries. At the end of this course, students are expected to be able to identify suitable quality techniques and tools to be implemented in production management and can apply industrial safety standards in real industrial environment.

Course Outcomes

CO1: Able to explain and illustrate the fundamentals of Industrial Safety and Quality Management.
CO2: Able to apply techniques and tools of Quality Management.
CO3: Able to analyse safety issues using Safety standards and tools.
CO4: Able to judge the issues and challenges of engineering ethics.

References

1. David L. Goetsch, Quality Management – Introduction to Total Quality Management for Production, Processing, and Services. 5th Ed., Pearson Prantice Hall, 2006.
2. C. Ray Asfahl, Industrial Safety and Health Management, 5th Ed., Pearson Prantice Hall, 2003.
3. BEM mandatory course Manual – Code of Ethics or Regulations, 2012
4. David L. Goetsch, Occupational Safety and Health, for Technologists, Engineering, and Managers., 4th ed., Prentice Hall. 2002.
5. Willie Hammer, Dennis Price, Occupational Safety Management and Engineering., 5th ed., Prentice Hall. 2001.
6. Howard S. Gitlow et. al, Quality Management, 3rd ed., McGraw-Hill. 2005

DMT231 Analogue Electronics

Synopsis

This course introduces the application and analysis of Bipolar Junction Transistor (BJT) and Field Effect Transistor (FET) and the usage in amplifier as well as power amplifier circuit. s

Course Outcomes

CO1: Able to understand basic theory of analogue electronics.
CO2: Able to analyze operation of Bipolar Junction Transistors (BJTs), Field Effect Transistors (FETs, BJTs multistage and Power amplifier circuits.
CO3: Able to construct circuit of BJT, FET and Power amplifier circuits experiment.

References

1. Donald A. Neamen, 'Microelectronic Circuit Analysis & Design, 4th Ed.', McGraw Hill International Edition, 2010
2. Thomas L. Floyd, 'Electronic devices: Conventional Current Version', 7th ed. 2004, Prentice Hall Robert L. Boylestead & Louis Nashelsky, 'Electronic Devices and Circuit Theory', 8th ed. 2013, Prentice Hall.
3. Robert T. Paynter, Introductory Electronic Devices and Circuits. 9th ed. 2006, Prentice Hall.
4. Adel S. Sedra, Kenneth C. Smith, Microelectronic Circuits, 7th ed. 2016. Oxford University
5. Thomas L. Floid, Electronic devices : electron flow version, 9th ed. 2014, Prentice Hall.

DMT232 Basic Electrical Machine

Synopsis

This course is to provide students with understanding of the basic concept of three phase system. Students also will gain knowledge on magnetic circuits, single-phase transformer. This course also covers electrical machine which related to single phase DC/AC machine and generator.

Course Outcomes

CO1: Able to apply the basic concept of three phase system.
CO2: Able to analyse the concept of magnetic circuit and machinery principles.
CO3: Able to construct the standard equivalent circuit and fundamental equations of transformers and dc machines.

References

1. Stephen J. Chapman, Electric Machinery Fundamentals, 5th Edition, McGraw Hill, 2011.
2. Charles K.Alexander & Matthew Sadiku, " Fundamentals of Electric Circuits", 5th Edition, International Education, McGraw Hill, 2013
3. P.C.Sen, Principles of Electric /machines & Power Electronics, 2nd Edition, John Wiley & Sons, 1997.
4. Edward Hughes, Ian McKenzie Smith, John Hiley, Keith Brown. Hughes Electrical & Electronic Technology, Prentice Hall, 10th Edition, 2008.
5. Stephen L.Herman, Electrical Transformers and Rotating Machines, 2nd Edition, Thomas Delmar Learning, 2006.

DMT233 Digital Fundamental II

Synopsis

The aim of this course is to expose students with the applications of combinational and sequential circuit. Emphasis will be given on the principles and applications of flip flop, counters, shift registers and introduction to the sequential circuit design.

Course Outcomes

CO1: Able demonstrate operation of flip flop, its applications and usage in synchronization circuits.
CO2: Able to differentiate counter circuit and shift register application and design.
CO3: Able to design operation of flip flop in basic sequential circuit design.

References

1. Floyd, Thomas L., "Digital Fundamentals", 11th Edition by Prentice Hall 2015.
2. Ronald J. Tocci, Neal S. Widmer and Gregory L. Moss, "Digital Systems: Principle and Applications", 11th Edition by Prentice Hall 2014.
3. Roger L. Tokheim, "Digital electronics: principles & applications", 7th Edition by Boston: McGraw-Hill Higher Education 2008.
4. Rafikha Aliana A. Raof et al, "Digital Electronic Design", by Pearson, Prentice Hall.
5. Donald D. Givone, "Digital Principle and Design", by McGraw-Hill 2003.

DMT234 Introduction to Semiconductor Physics and Devices

Synopsis

Introduction to semiconductor devices and technology, energy bands and carrier concentration in thermal equilibrium, carrier transport phenomena, p-n junction, bipolar transistor and related devices, MOSFET and related devices, MESFET and related devices.

Course Outcomes

CO1: Able to explain the theory of semiconductor physics and devices.
CO2: Able to evaluate a problem and performance issues in semiconductor processes.
CO3: Able to differentiate semiconductor devices behaviours.

References

1. S. M. Sze, Semiconductor Devices: Physics and Technology, 2nd Ed., John Wiley & Sons, Inc., 2005.
2. S. M. Sze, K. K. Ng, Physics of semiconductor devices, John Wiley, 2007, USA
3. F. P. Robert, Advanced Semiconductor Fundamentals, 2nd ed. 2003, Prentice Hall, USA
4. Peter Y. Yu, M. Cardona, Fundamental of Semiconductors: Physics and materials properties (advanced text in physics), Springer-Verlag, 2001, Germany.
5. G. G. Streetman, S. K. Banerjee, Solid State Electronic Devices, Prentice Hall, 2006, USA

DMT241 Introduction to IC Layout

Synopsis

This course introduces the basic logic circuits design, Layout versus schematic design of Integrated Circuits as well as application in the design of ICs.

Course Outcomes

CO1: Able to apply the microelectronic technologies, IC design flow and VLSI design style in layout.
CO2: Able to develop CMOS transistor concept and logic circuits design.
CO3: Able to design an IC layout circuit.

References

1. Alan Hastings, The Art of Analog Layout (2nd Edition), Pearson Prentice Hall, 2006.
2. Christopher Saint, Judy Saint, (2002), IC Layout Basics: A Practical Guide, New York: McGraw-Hill, c2002.
3. Dan Clein, (2000), CMOS IC Layout: Concepts, Methodologies, and Tools, Boston: Newnes , c2000.
4. John P. Uyemura, CMOS Logic Circuit Design, Boston: Kluwer Academic Publishers, 2003.
5. R. Jacob Baker, CMOS: Circuit Design, Layout, and Simulation, New York: IEEE Press/Wiley-Interscience , 1998.

DMT242 Wafer Fabrication

Synopsis

This course introduces the processes that involved in ICs fabrication. Both theories and practical are used to assure that students able to perform the wafer fabrication processes independently.

Course Outcome

CO1: Able to explain, fundamental of semiconductor and process in wafer fabrication.
CO2: Able to analyze theoretical background of each process involved in fabrication process.
CO3: Able to illustrate and develop the structure and important parameter in fabrication process.

References
1. Hong Xiao. (2005). Introduction to Semiconductor Manufacturing Technology. Prentice Hall.
2. Peter Van Zant (2000). Microchip Fabrication: A Practical Guide to Semiconductor Processing. Mc Graw Hill.
3. Campbell, S. A. (2001). Science And Engineering of Microelectronics Fabrication. New York: Oxford University Press
4. S. M. Sze, Semiconductor Devices: Physics and Technology, 2nd Ed., John Willey & Sons, Inc., 2005.
5. F.P.Robert, Advanced Semiconductor Fundamentals, 2nd ed. 2003, Prentice Hall, USA

DMT243 Electronic Packaging

Synopsis
This course exposes students to the electronics packaging process flow and the statistical analysis method to control the semiconductor packaging processes.

Course Outcomes

CO1: Able to explain the semiconductor packaging process flow.
CO2: Able to evaluate the critical parameters in semiconductor packaging process.
CO3: Able to develop technology trend in semiconductor packaging.

References
1. Rao Tummala. (2001).Fundamentals of Microsystem Packaging. Mc-Graw Hill Professional.
2. William D. Brown (Editor). (1999). Advanced Electronic Packaging with Emphasis on Multichip Modules. New York :IEEE Press Series on Microelectronics Systems. The Institute of Electrical and Electronics Engineers Inc.
3. Glenn R. Blackweel. (2000). The Electronic Packaging Handbook. Florida U.S : CRC Press LLC.
4. M. Datta, T. Osaka, J.W Schultze (Editor). (2005). Microelectronic Packaging. Florida U.S : CRC Press,
5. Patrick O'Conner (2002). Practical Reliabiliy Engineering, Wiley.

DMT244 Failure Analysis

Synopsis
This course focuses on the concepts and techniques of failure analysis in the semiconductor industry. Different types of failure analysis techniques and test instrumentation involves are covered in this course.

Course Outcomes

CO1: Ability to define the terms commonly used in failure analysis and explain the failure analysis process flow.
CO2: Ability to identify, compare, explain and illustrate (where applicable) the different tools and techniques available in FA, its importance and the details operation principle
CO3: Ability to make an interpretation of results of analysis and to choose the most suitable FA techniques to be conducted,given a particular failure .

References
1. Patrick O'Conner (2002). Practical Reliabiliy Engineering, Wiley
2. Failure Analysis, A Practical Guide for Manufacturers of Electronic Component and Systems, Marius Bazu and Titu Bajenscu, John Wiley
3. E. Ajith Amerasekera and Farid N. Najm (1997). Failure Mechanisms in Semiconductor Devices. 2nd Ed.: John Wiley & Sons
4. Lawrence C. Wagner, (1999). Failure Analysis of Integrated Circuits: Tools and Techniques.: Kluwer Academic Publishers.
5. Reliability and Failure Analysis (2012), Noraini Othman, Nurjuliana Juhari, Nur Hamidah Abdul Halim, UniMAP

DMT245 Introduction to Microcontroller

Synopsis

The aim of this course is to study the use of microcontroller system for a variety of applications. It covers hardware aspects such as interfacing techniques, software design, coding in assembly language, basic multitasking concept and developing and embedded system application.

Course Outcomes

CO1: Able to apply the basic concepts of a microcontroller system.
CO2: Able to apply the skill to develop a program for microcontroller system using assembly language.
CO3: Able to construct a program and interfacing between microcontroller systems to external peripheral devices to solve real-time problems.

References

1. Muhammad Ali Mazidi, Janice Gilispie Mazidi & Rolin D. Mckinlay The 8051 Microcontroller and Embedded Systems Using Assembly and C. 2nd Edition, Pearson Edition, 2006.
2. I. Scott Mackenzie & Raphael Chung-Wei Phan 8051 Microcontroller. 4th Edition, Prentice Hall, 2007.
3. Kenneth J. Ayala The 8051 Microcontroller – Architecture, Programming & Applications. 2nd Edition, Delmar Learning, 1996.
4. W. Kleitz Microprocessor and Microcontroller Fundamentals: The 8085 and 8051 Hardware and Software. Prentice Hall, 1998.
5. James W. Stewart & Kai X. Miao The 8051 Microcontroller: Hardware, Software & Interfacing. 2nd Edition, Prentice Hall, 1999.

DMT351 Semestral Project

Synopsis

The Semestral Project is a small-scale design and applied projects for final year diploma students and expected to complete within one semester. The projects based in solving engineering problems by problems understanding, troubleshooting, identify, solving, and report writing. The projects cover electronics circuits, digital logics design, embedded and microprocessor system interfacing, PLC programming, computer system and software development.

Course Outcomes

CO1: Able to identify solution based on problem study.
CO2: Able to design engineering solution utilizing an engineering practice.
CO3: Able to perform an engineering project.
CO4: Able to write a technical report and communicate in oral presentation.

References

1. Semestral Project's Guideline for Diploma Engineering Programmes, UniMAP, 2008
2. Any publish material such as writing, multimedia or personal communication that related to the project topics

DMT352 Electronic Instrumentation

Synopsis

This course introduces students to the electronic instruments such as oscilloscope, function generators, voltmeters, analog DC and AC meters. The students also will be introduced to the Dc and AC bridge circuits to measure resistance, capacitance and inductance. In addition, students will be exposed to the AC and DC converter, transducers, sensors, and basic amplifier and filter.

Course Outcomes

CO1: Able to identify the electronic measurement tools.
CO2: Able to apply the electronic measurement tools for engineering application
CO3: Able to construct the circuit of electronics instrumentation.

References

1. H.S Kalsi, "Electronic Instrumentation, 2nd Edition McGraw Hill, 2010.
2. Stanley Wolf, Richard F.M Smith, "Student Reference Manual for Electronic Instrumentation Laboratories ". 2nd Edition , Prentice Hall, 2009
3. Robert B. Gilles, "Instrumentation and measurement for Electronic Technician", 2nd Edition , Prentice Hall, 2014

DMT353 Introduction to PLC

Synopsis

Programmable Logic Controllers (PLCs) are the predominant tool for controlling industrial and specialty systems. These computer based controllers provide a variety of programming options and easily configurable inputs and outputs. This course deals with the basic operation, application and programming of the integrated industrial control system, concentrating on the industrial PLC. The course covers introduction to PLC, basic PLC operations and instructions, product ranges, benefits numbering systems and codes and logic concepts pertaining to PLCs. The student will develop an understanding of the PLC central processing unit, input-output systems, programming and peripheral devices, and programming languages and will develop skills in programming and documenting on a cross section of industrial PLCs.

Course Outcomes

CO1: Able to relate basic concept of PLC and hardware components.
CO2: Able to construct a PLC system using ladder diagram and mnemonic code.
CO3: Able to design PLC applications using timer and counter.

References

1. Frank D. Petruzella, "Programmable Logic Controllers", 3rd ed., McGraw-Hill International., 2005
2. W. Bolton, "Programmable Logic Controllers", 5th ed., Elsevier Ltd., 2009
3. Jon Stenerson, "Fundamental of Programmable Logic Controllers, Sensors, and Communication", PEARSON-Prentice Hall, 2004.
4. Gary Dunning "Introduction to Programmable Logic Controller" 3rd ed., THOMSON DELMAR LEARNING, 2006
5. James A. Rehg, Glenn J. Sartori, "Programmable Logic Controllers", 2009

DMT354 Introduction to Control System

Synopsis

Throughout this course, students will learn the basic control system such as open-loop system, closed-loop system, block diagram and signal flow graph. Students also will be introducing to mathematical modeling of electrical and mechanical systems in frequency and time domains using Laplace transform. Student will be able to analyze time response and stability of linear system via root locus and Bode plot techniques. The experiments will be used to aid the students understanding of the concept introduced.

Course Outcome

CO1: Able to explain basic structure of control system and use Laplace transform to solve mathematical model.
CO2: Able to analyze time response analysis and control system problem into mathematical model.
CO3: Able to propose system performance and system stability.

References

1. Richard C. Dorf & Robert H. Bishop: Modern Control System- 13th ed, Prentice Hall, 2017
2. Norman S. Nise: Control System Engineering- 6th ed, John Wiley & Sons, 2011.
3. Syed Najib Syed Salim, Maslan Zainon: Control System Engineering, UTEM, 2010.
4. Ogata, Katsuhiko : Modern Control Engineering-4th ed, Prentice Hall, 2010.
5. I.J Nagrath, M.Gopal: Control System Engineering-5th ed, Kent, U.K, Anshan Ltd, 2008.

PROGRAM KEJURUTERAAN

MEKATRONIK

PROGRAM DIPLOMA KEJURUTERAAN MEKATRONIK (R2423)

Kejuruteraan Mekatronik adalah merupakan satu bidang pelbagai disiplin yang menggabungkan elemen Mekanikal, Kawalan dan Elektronik. Kesemua elemen ini diintegrasikan di dalam Program Diploma Kejuruteraan Mekatronik yang memberi penekanan kepada bidang automasi dan robotik. Program ini direkabentuk bagi memenuhi keperluan tenaga kerja professional dan menepati kehendak industri yang memerlukan graduan yang mempunyai asas pengaturcaraan dan ilmu automasi industri bagi menghadapi Revolusi Industri 4.0. Di antara kursus yang ditawarkan bagi mencapai hasrat Dasar Pendidikan Negara adalah seperti 'Industrial Automation and Robotic', 'Programmable Logic Controller', dan 'Microcontroller and Interface'. Program Diploma Kejuruteraan Mekatronik bermatlamat melahirkan graduan yang berkemahiran tinggi serta berkemahiran insaniah dalam era Revolusi Industri 4.0.

Graduan Diploma Kejuruteraan Mekatronik mempunyai permintaan yang tinggi dalam pasaran terutama industri elektronik dan mekanikal. Prospek kerjaya sebagai juruteknik dan pembantu jurutera adalah luas samada di sektor swasta mahupun jabatan kerajaan. Antara sektor-sektor yang menawarkan peluang pekerjaan kepada graduan Diploma Kejuruteraan Mekatronik adalah seperti berikut:

- Industri perkilangan dan pembuatan
- Industri automotif
- Industri pertanian dan makanan
- Industri minyak dan gas
- Firma teknologi tinggi seperti aeroangkasa
- Firma perundingan
- Firma kejuruteraan dan pembangunan produk
- Firma pembangunan perisian
- Institusi penyelidikan dan pembangunan
- Jabatan kerajaan dan badan berkanun

Antara peluang kerjaya bagi graduan Diploma Kejuruteraan Mekatronik:

- Juruteknik / Pembantu Jurutera Mekatronik
- Juruteknik / Pembantu Jurutera Elektronik
- Juruteknik / Pembantu Jurutera Mekanikal
- Juruteknik / Pembantu Jurutera Pengeluaran
- Juruteknik / Pembantu Jurutera Kawalan Kualiti
- Juruteknik / Pembantu Jurutera Rekabentuk
- Juruteknik / Pembantu Jurutera Proses
- Juruteknik / Pembantu Jurutera Penyenggaraan
- Pembantu Penyelidik

PROGRAM DIPLOMA KEJURUTERAAN MEKATRONIK (R2423)

TAHUN	PERTAMA		KEDUA		KETIGA	
SEMESTER	I	II	III	IV	V	VI
KURSUS TERAS KEJURUTERAAN (81)	DKA104/2 Matematik Awalan	DQT101/3 Matematik I	DQT102/3 Matematik II	DQT203/3 Matematik III	DNT333/3 Keselamatan Industri & Pengurusan Kualiti	DIT361/6 Latihan Industri
	DCT100/2 Kemahiran Asas Kejuruteraan	DNT113/3 Litar Elektrik	DNT233/3 Termo Bendalir	DNT241/3 Pneumatik dan Hidraulik	DNT351/3 Projek Semestral	
	DNT111/2 Lukisan Kejuruteraan	DNT122/3 Mekanik Gunaan	DNT235/3 Asas Teknologi Elektrik	DNT242/3 Mekanisma Elemen Mesin	DNT352/3 Automatan Industri dan Robotik	
	DNT112/2 Asas Sains Kejuruteraan	DNT123/2 Lukisan Terbantu Komputer	DNT236/3 Kejuruteraan Bahan	DNT245/3 Penderiaan dan Pengukuran	DNT354/3 Prinsip Kawalan	
	DNT126/3 Asas Pengaturcaraan Komputer	DNT128/3 Sistem Digit	DNT238/3 Elektronik Analog	DNT246/3 Mikropengawal & Pengantaramuka	DNT355/3 Proses-Proses Pembuatan	
	DUT123/2 Kemahiran Teknologi Dalam Komunikasi	DNT134/2 Amalan Bengkel Mekatronik		DNT253/3 Pengawal Pengaturcara Logik		
81	11	16	15	18	15	6
KURSUS WAJIB UNIVERSITI (14)	DVW101/2 Bahasa Inggeris Komunikasi I	DVW201/2 Bahasa Inggeris Komunikasi II	DVW301/2 Bahasa Inggeris Komunikasi III		DUW224/2 Kesedaran Kejuruteraan	
	DVW410/2 Bahasa Melayu		DUW239/2 Pengajian Malaysia II			
	DZWXXX/1 Badan Beruniform 1	DZWXXX/1 Badan Beruniform 2				
14	5	3	4	0	2	
95	16	19	19	18	17	6

Nota:
DKA104/2 Matematik Awalan: Prasyarat untuk Matematik Tambahan peringkat SPM dengan gred D.

DKA104 Preliminary Mathematics (Matematik Awalan)

Synopsis

Mathematics is a required course of study in engineering programs diploma. This is due to the importance of mathematics as a tool in solving problems. This course is offered to master some basics mathematical knowledge and as a preparation for advance mathematics subjects which involve application in engineering.

Course Outcomes

CO1: Ability to express the concepts of trigonometry.
CO2: Ability to express relevant concepts and methods in algebra.
CO3: Ability to relate and apply the concepts and methods in calculus.CO4: Ability to apply the concepts of statistics and probability.

Reference

1. Stroud, K. A. "Engineering Mathematics", 7th. Ed. Palgrave MacMillan, 2013

DNT111/2 Engineering Drawing (Lukisan Kejuruteraan)

Synopsis

Objective of this course is to provide exposure and skills to Engineering Diploma holders in basic Engineering Drawing and its engineering applications. The course will cover the detail of Engineering Drawing for beginners before going in depth on projection systems followed by oblique and isometric sketches. Knowledge in dimensioning and geometrical tolerance will enhance student's ability in interpreting and assessing information from basic raw data of an engineering drawing. Undergraduate students will also have the advantage to experience practical engineering drawing projects for familiarity from conceptual exposures and classroom theories.

Course Outcomes

CO1: Ability to apply basic skills of engineering drawing in mechatronic engineering and practical test related problems.
CO2: Ability to illustrate engineering drawing by using proper techniques.
CO3: Ability to use engineering drawing knowledge and apply to engineering field.
CO4: Ability to perform in group/teams to illustrate engineering drawing.

References

1. Frederick E. Giesecke, "Technical Drawing with Engineering Graphics " 14th Ed., Pearson, 2014.
2. Basant Agrawal, C M Agrawal, "Engineering Graphics",Tata McGraw Hill Education Private Limited., Tata McGraw-Hill, 2012.
3. Frederick E. Giesecke, "Modern Graphics Communication", 4th Ed.,Pearson Prentice-Hall,2010.

DNT112/2 Basic Engineering Science (Asas Sains Kejuruteraan)

Synopsis

This course offers comprehensive contents about fundamentals of basic engineering science knowledge. Students are expected to acquire knowledge of physical and science phenomena, which is the basic of engineering field. Theories, principles, and standard units are covered in each syllabus for better understanding in this course.

Course Outcomes

CO1: Able to calculate the principal and basic concept of physics in engineering system.
CO2: Able to determine the concept of physics to solve the variety of problems.
CO3: Able to perform in group/teams to solve the variety of problems and demonstrate the solution.

References

1. Hugh D. Young, Philip W. Adams, Raymond J. Chastain , "College Physics". 10th ed. Pearson, 2016
3. Randall D. Knight, Brian Jones, Stuart Field , "College Physics". 3rd ed. Pearson, 2015
4. Raymond Serway, Chris Vuille, "College Physics", 11th ed. Cengage Learning, 2017
5. Young & Freedman, "University Physics with Modern Physics Technology Update". 13th ed. Pearson, 2014
6. Allan Giambattista, Betty McCarthy Richardson, Robert C. Richardson, "College Physics", 4th ed. Mc Graw Hill, 2013.

DNT123/3 Basic Computer Programming (Asas Pengaturcaraan Komputer)

The aim of this course is to enable the students to learn the computer system concepts and requirements, problem solving analysis and programming concept including variables, operator, control structure, function, array, file manipulation, structure and pointer.

Course Outcomes

CO1: Able to define and describe programming concepts and principles.
CO2: Able to write computer programs using programming techniques and tools.
CO3: Able to solve problems using computer programming techniques.

References

1. Deitel & Deitel, Paul DeiteL Harvey Deitel"C *How To Program with an intro to* C++", Eight edition.Pearson-Prentice Hall, 2016.
2. Bradley L. Jones, "C Programming in One Hour a Doy" Pearson Education, 2013.
3. Dey P. and Ghosh M., Computer Fundamentals and Programming in C. 2nd Edition. New Delhi: Oxford University Press . 2013.
4. Cheng H. H., C for Engineers and Scientists:An Interpretive Approach. United States: McGraw-Hill Education., 2014

DNT113/3 Electrical Circuit (Litar Elektrik)

This course is designed to provide students with fundamentals of electrical circuit, both in theory and practice. Students are expected to acquire knowledge and able to explain basic concept and law of electric elements, able to select and apply electrical circuit theorem, and able to explain and apply basic concept of AC circuit analysis. Knowledge on theory acquired in lecture is also enhanced with practical works conducted in laboratory.

Course Outcomes

CO1: Able to solve the basic concept of electrical circuits problems.
CO2: Able to analyze the sinusoidal steady state circuit problems
CO3: Able to construct electrical circuits using circuit theorems and basic laws.
CO4: Able to perform in group/teams to construct electrical circuit, apply and demonstrate the knowledge in electrical circuit application.

References

1. Charles K. Alexander and Matthew N.O. Sadiku, *Fundamentals of Electric Circuits, 6th edition,*International Editions McGraw Hill, 2017 .
2. Floyd, Thomas L., *Principles of Electric Circuit, Conventional Current Version,* 9th Edition, Pearson New International Edition, 2014.
3. Charles K. Alexander and Matthew N.O. Sadiku, *Fundamentals of Electric Circuits, 5th edition,*International Editions McGraw Hill, 2013 .
4. James W. Nilsson and Susan Riedel (2015)," Electric Circuits", 10th Edition. Pearson
5. McKenzie-Smith, Hughes, Brown & Hiley,"Electrical and Electronic Technology", Ninth Edition. Pearson

DNT122/3 Applied Mechanics (Mekanik Gunaan)

This course aims to expose the students on basic concept of force, moments, moments of Couple and resultant force. As for application to this statics system, student will study on structure's equilibrium and stability such as truss, frame and machine. Students will also acquire an in- depth understanding in friction and distributed forces in statics system. In dynamics, student will be exposed to kinematics and kinetics for particles and rigid bodies solution which involve forces and acceleration by using resolution of force into components, impulse and momentum, and also work and energy.

Course Outcomes

CO1: Able to analyze the resultant of force from a system of force and forces – moment problems.
CO2: Able to analyze the equilibrium in particle and rigid body problems.
CO3: Able to develop the kinematics and kinetics study for particles..
CO4: Able to apply and demonstrate the knowledge in applied mechanics application

References

1. Hibbler, R.C, Engineering Statics in SI Units. 14th ed., Prentice Hall (2017)
2. Hibbler, R.C, Engineering Dynamics in SI Units. 14th ed., Prentice Hall (2017)
4. Beer, F. B. and Johnston, E. R. Jr., Vector Mechanics for Engineers Statics. 10th ed., Canada, McGraw Hill (2013)
5. Beer, F. B. and Johnston, E. R. Jr., Vector Mechanics for Engineers Dynamics. 10th ed., Canada, McGraw Hill (2013)
6. J.L. Meriam and L. Glenn Kraige, Engineering Mechanics: Statics, John Wiley & Sons, Inc, 2011.
7. J.L. Meriam and L. Glenn Kraige, Engineering Mechanics: Dynamics, John Wiley & Sons, Inc, 2009.
8. Raymond A. Serway and Chris Vuille, "College Physics" , 9th Ed.Cengage Learning, 2012

DNT1232 Computer Aided Drafting (CAD) (Lukisan Terbantu Komputer)

The main objective of this course is to expose the Diploma Engineering students with skills of Computer Aided Drafting and its application. This course is an extension from manual hand drawing into the usage of CAD software which focuses on product design in 2D and 3D.

Course Outcomes

CO1: Ability to apply fundamental concepts of Computer Aided Drafting in mechatronic engineering related problems.
CO2: Ability to illustrate engineering drawing by using proper techniques.
CO3: Ability to use of Computer Aided Drafting to construct a simple product design and apply to engineering areas.
CO4: Ability to perform in group/teams to illustrate 2D and 3D modeling.

References

1. Terry T. Wohlers, "Applying AutoCAD 2013", McGraw Hill, 2013.
2. Elliot Gindis, "Up and Running with AutoCAD 2012 2D and 3D Drawing and Modeling", Academic Press, 2012.
3. Kevin Lang, "AutoCAD Tutor for Engineering Graphics 2013 and Beyond", Delmar, 2012.

DNT1283 Digital Systems (Sistem Digit)

In this course the students will be exposed to the basic principle introduction of digital systems, digital circuit design and analysis. Lecture and practical will cover the following: Algebra Boolean, Numbering system, Basic Logic Gate, Combinational Logic Circuit Design, Bi-stable Memory Devices and Sequential Circuits Design.

Course Outcomes

CO1: Able to explain the concept of digital system.
CO2: Able to analyze the combinational and sequential logic circuits.
CO3: Able to design simple circuits and system of basic digital electronics.
CO4: Able to perform in group/teams to construct digital circuit and demonstrate its function and application.

References

1. Thomas L.Floyd, "Digital Fundamentals", 11th Edition by Pearson, 2015.
2. Ronald J.Tocci, Neal S.Widmer and Gregory L.Moss, "Digital Systems: Prinsiples and Applications", 12th Edition by Pearson, 2018.
3. Floyd, Thomas L., "Digital Fundamentals", 10th Edition by Prentice Hall 2012.
3. Floyd, Thomas L., "Digital Fundamentals", 10th Edition by Prentice Hall 2012.
4. Vogin G. Oklobdzija, Digital Systems and applications, 2nd edition, 2007
5. Raj Kamal, "Digital systems: Prinsiples and Design", 3rd edition by Pearson Education 2009.

DNT1342 Mechatronics Workshop Practice (Amalan Bengkel Mekatronik)

The objective of the course is to prepare the students with the skills in mechanical, electrical and electronics practices. The syllabus includes two mini projects; mechanical based and electrical/electronic based. In both mini projects, the students need to implement the knowledge that includes the practice of metrology, welding, metal sheet, wiring and soldering. The whole subjects will combine with other important technical elements such as technical design and knowledge on handling safety at work.

Course Outcomes

CO1: Ability to apply mechanical skills to complete tasks and problems given.
CO2: Ability to apply electrical and electronic skills to complete tasks and problems given.
CO3: Ability to work individually as well as in groups to complete a given task.

References

1. Roger L. Brauer, Safety and Health for Engineers, 3rd Ed., Wiley (2016)
2. Michael E. Brumbach, Industrial Maintainence, 2nd Ed., Cengage Learning (2013)
3. Connie Dotson, Fundamentals of Dimensional Metrology, 6th Ed., Cengage Learning (2015)
4. Larry Jeffus, Welding: Principles and Applications, 8th Ed., Cengage Learning (2016)
5. Marcus Bowman, Sheet Metal Work, Crowood Press (2015)
6. Trevor Linsley, Basic Electrical Installation Work, 7th ed, Routledge (2013)
7. Sengupta R, Principles of Reliable Soldering Techniques, New Age International Private Limited (2017)

DNT2233 Thermo Fluids (Thermo-Bendalir)

This course is designed to provide a background of the fundamental principles and engineering applications of thermodynamics, heat transfer and fluid mechanics. These three areas collectively make up the field of thermal sciences but are traditionally taught as separate courses. However, in this course sequence, the three areas are presented together. Topics covered include, but are not limited to: fundamentals of thermodynamics, application of the laws of thermodynamics to various systems; various modes of heat transfer under steady state conditions; fluids static and dynamics; law of conservation of mass Bernoulli's equation; flow in pipes. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes

CO1: Able to describe the concept of fluid mechanics, thermodynamics and heat transfer.
CO2: Able to adapt various law s of fluid mechanics, thermodynamics and heat transfer in engineering problems.
CO3: Able to demonstrate the fundamental principle of of fluid mechanics, thermodynamics and heat transfer.

References

1. 1. Yunus A. Cengel, John M. Cimbala and Robert H. Turner, Fundamental of Thermal-Fluid Sciences, Fourth Editions, McGraw-Hill, New York, 2016.
2. Robert W. Fox, Alan T. Mcdonald, Philip J. Pritchard and John W. Mitchell, Fluid Mechanics, Ninth Editions, Wiley, New York., 2016.
3. Munson B. R., Young D. F. and Okiishi T. H., Fundamentals of Fluid Mechanics, 5th Editions, Wiley, New York, 2006.
4. Borgnakke C. and Sonntag R. E., Fundamentals of Thermodynamics, 7th Editions, Wiley, New York, 2009.
5. Moot R. L., Applied Fluid Mechanics, 6th Editions, Pearson Prentice Hall, New York, 2006.

DNT2353 Basic Electrical Technology (Asas Teknologi Elektrik)

The objective of the course is to introduce the students with the fundamental concepts of electric circuits, electrical supply systems and installations, magnetic and electromagnetic, inductance, capacitance and AC circuit, three-phase system, basic principles of electrical machines, DC and AC electrical machines, transformer and electrical safety. The laboratory will be used to enhance understanding of the concept introduced.

Course Outcomes

CO1: Able to apply concept electrical circuits and magnetic circuits to solve engineering problems.
CO2: Able to solve the characteristics of three-phase circuits and electromagnetic
CO3: Able to solve the basic principles of the electrical machines and transformer
CO4: Able to develop the concept of basic electrical technology in industrial applications.

References

1. Chapman, Stephen J: Electric Machinery Fundamentals - 5th Ed., McGraw Hill, 2012.
2. Rajput, R. K, "Electrical machines", 6th Ed, Laxmi Pub. 2017.
3. Charles K. Alexander, Matthew N. O. Sadiku, "Fundamentals of Electrical Circuits", 5th Ed, McGraw Hill, 2015.
4. Bhattacharya, S. K., "Electrical Machines", 4th Ed, McGraw Hill, 2014.
5. A. E. Fitzgerald, "Electrical Machinery", 7th Ed., McGraw Hill, 2013.
6. James W. Nilsson, Susan A. Reidel, "Electric Circuits", 10th Ed, Prentice Hall, 2015.

DNT2363 Engineering Materials (Kejuruteraan Bahan)

To introduce some fundamentals of materials engineering, relationship between structures and properties of materials and phase diagram.

Course Outcomes

CO1: Able to calculate the mechanical properties in engineering applications
CO2: Able to discuss on the fundamental concept of materials engineering.
CO3: Able to organize appropriate processes for selected material to use in current engineering applications
CO4: Able to perform in group/teams to solve the problems and demonstrate the solution.

References

1. Smith, W.F. Foundations of Materials Science and Engineering. 6th Ed. Singapore: McGraw Hill, 2013
2. Callister, W.D. Jr. Materials Science and Engineering: An Introduction. 9th Ed. New York, NY: John Wiley and Sons, 2014.
3. Donald, B, Askeland & Pradeep, P, Phule. The Science and Engineering of Materials. 7th Ed., CL Engineering, 2015.
4. Raghavan, V. Materials Science and Engineering: A First Course – 6th Ed., Prentice-Hall of India Pvt. Ltd., 2015.
5. Upadhyaya, G.S. Metal Science: Past, Present and Future (Materials Science Foundation) – 1st Ed., Trans Tech Publication, 2013.

DNT2383 Analogue Electronics (Elektronik Analog)

This course is designed to provide students with fundamentals of electronic devices, circuit and applications, both in theory and practice. Students are expected to acquire knowledge of semiconductor, diode and application, bipolar junction transistor (BJT) and its biasing, field effect transistor (FET) and its biasing and the applications of these devices. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes

CO1: Able to explain the theory of semiconductor materials and selected electronic devices.
CO2: Able to analyze diode applications in analogue electronic circuit.
CO3: Able to design transistor circuit and applications as amplifier
CO4: Able to construct electronic circuit, apply and demonstrate the knowledge in analogue electronic circuit application.

References

1. Thomas L. Floyd. “Electronic Devices (conventional current version)”, 10th Edition, Pearson, 2018.
2. Boylestad et al, “Electronic Devices and Circuit Theory”, 11th Edition by Pearson, 2014.
3. Giovanni Saggio, “Principles of Analog Electronics”, by Taylor & Francis Group, 2014.
4. Thomas L. Floyd & David M. Buchla, “Analog fundamentals: a systems approach”, by Pearson, 2013.
5. Thomas L. Floyd., “Electronic devices (electron flow version)”, 9e by Pearson, 2012.

DNT2413 Pneumatics and Hydraulics (Pneumatik dan Hidraulik)

This course is designed to provide students with fundamentals of pneumatic and hydraulic control systems both; in theory and practice. Students are expected to acquire knowledge of physical behaviour of pneumatics and hydraulics control system, the pneumatics and hydraulics components and applications. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes

CO1: Able to describe the concepts of Pneumatic & Hydraulic Systems.
CO2: Able to design the Pneumatic/hydraulic Systems that related to industrial applications.
CO3: Able to construct a pneumatics and hydraulic circuit

References

1. Anthony Esposito, P. Crosser and F. Ebel (2016). Fluid Power with Applications: Sevent Edition. *Pearson New International Edition.*
2. Andrew Parr. (2006). Hydraulics & Pneumatics: A Technician and Engineer Guide. *Butterworth• Heinemann.*
3. Buro J.P. Hasebrink (2000). Basic Pneumatic: Volume I. *Mannesmonn Rexroth Pneumatics GmbH.*
4. P. Crosser and F. Ebel (2000). "Pneumatics."7thed. Festo Didactic GmbH & Co.
5. J.P Hasebrink (1991). "Basic Pneumotics". [st ed. Bosch RexrothAG
6. R. Balla (1990)"Electropneumatics." Ist ed. Mannesmann Rexroth Pneumatics GmbH
7. Chris Stacey. (1999). "Engineering Application of Pneumatics & Hydraulics" Butterworth• Heinemann

DNT2423 Machine Mechanism Elements (Mekanisme Elemen Mesin)

The objective of the course is to prepare the students with the skills and knowledge in machine mechanism disciplines. The practical syllabus includes power transmission elements, shaft and bearing, drive gear, flexible element drive, camshaft and follower and also linkages system. The whole subjects will combine with other important technical elements such as mechanical design and international standard that need to be followed in design. With the help of practical projects, the students will obtain a better perspective on the subjects of their studies because they will confront the problems of implementation of what they have learnt in their mechatronics courses.

Course Outcomes

CO1: Able to create new point of view in the design philosophies for machine design.
CO2: Able to discuss in teams on the general types and the characteristics of mechanical drive elements.
CO3: Able to calculate the mechanism of mechanical elements and mobility of mechanical system
CO4: Able to perform in group/teams to solve the problems and demonstrate the solution.

References

1. Robert L. Mott, John Tang, "Machine Element in Mechanical Design", 5th Edition, Prentice Hall, 2014.
2. John E. Shigley, Charles R. Mischke, "Mechanical Engineering Design", 10th Edition, Mc Graw Hill, 2015.

3. R.C. Hibbeler, "Engineering Mechanics Dynamics", 11th Edition, Prentice Hall, 2007.
4. Spotts, "Design of Machine Elements", 8th Edition, Prentice Hall, 2005.

DNT245/3 Sensors & Measurement (Penderiaan dan Pengukuran)

This course is designed to provide students with fundamentals of measurement systems; in theory and practice. Students are expected to acquire knowledge of basic measurement circuits; resistance- based transducers; magnetic-based transducers; capacitance-based transducers; self-generating transducers; electrochemical transducers; semiconductor transducers; mechanical transducers in flow measurement, pressure, force and weight; interfacing with computer and data input. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes

CO1: Able to apply the basic concepts of transducers, sensors and measurement.
CO2: Able to suggest the suitable transducers and sensors for various measurement purposes.
CO3: Able to justify the measurement techniques.
CO4: Able to apply and demonstrate the knowledge in sensors and measurement application.

References

1. Alciatore, D.G., Histand, M.B., "Introduction to Mechatronics and Measurement Systems", 4th Edition, McGraw Hill, 2012.
2. Johnson, C.D., "Process Control Instrumentation Technology", 8th Edition, Pearson, 2013.
3. Nawrocki, Waldemar., "Measurement Systems and Sensors", 2nd Edition, Artech House Publishers, 2015.
4. Bakshi, U.A., Bakshi, A.V., "Electrical Measurements and Instrumentation", Technical Publications, 2014.
5. Alan S Morris, A.S., Reza Langari, R., "Measurement and Instrumentation: Theory and Application", 2nd Edition, Academic Press, 2015.
6. Ganji, A.R., Wheeler, A.J., "Introduction to Engineering Experimentation", 3rd Edition, Pearson, 2010.

DNT246/3 Microcontroller and Interfaces (Mikropengawal dan Pengantaramuka)

This course is designed to provide students with fundamentals of microcontroller and the hardware both; in theory and practice. Students are expected to acquire knowledge of programming, electronic components and applications. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes

CO1: Able to apply the theory and basic architecture of microcontroller.
CO2: Able to construct the program using assembly language.
CO3: Able to construct the interfacing between microcontroller and the I/O devices.
CO4: Able to design an application based on microcontroller system.

References

1. Muhammad Ali Mazidi, Rolin D. Mckinlay & Danny Causey PIC Microcontroller and Embedded Systems: Using Assembly and C for PIC18, Pearson Prentice Hall 2008
2. Barry B. BreyApplying PIC18 Microcontrollers: Architecture, Programming, and Interfacing using C and Assembly, Pearson Prentice Hall 2008
3. Huang Han-Way PIC Microcontroller: An Introduction to Software and Hardware Interfacing, Thomson & Delmar Learning, 2005
4. John B. Peatman Design with PIC Microcontrollers, Prentice Hall , 1998
5. Martin Bates Interfacing PIC Microcontrollers: Embedded Design by Interactive Simulation, Newnes 2006.

DNT253/3 Programmable Logic Control (PLC) (Pengawal Pengaturcara Logik)
This course deals with the basic operation, application and programming of the integrated industrial control system, concentrating on the industrial microprocessor programmable logic controller (PLC). The course covers historical background, uses of PLCs, product ranges, and benefits numbering systems and codes and logic concepts pertaining to PLCs. The student will develop an understanding of the PLC central processing unit, input-output systems, programming and peripheral devices, and programming languages and will develop skills in programming and documenting on a cross section of industrial PLCs.

Course Outcomes

CO1: Able to explain the type of components in an electrical controller.
CO2: Able to apply the basic concept of PLC and its applications in industrial control application
CO3: Able to design PLC programming, editing and program observation
CO4: Able to perform in group/teams to solve the problems and demonstrate the solution

References

1. Frank D. Petruzella "Programmable Logic Controller", 5th ed., McGRAW-HILL EDUCATION., 2017
2. Jon Stenerson, "Fundamental of Programmable Logic Controllers, Sensors, and Communication", 3rd ed., PEARSON-Prentice Hall,2005.
3. Gary Dunning "Introduction to Programmable Logic Controller" 3rd ed., THOMSON DELMAR LEARNING, 2006
4. John W. Webb, Ronald A Reis, "Programmable Logic Controllers Principles and Applications" 4d ed., PRENTICE HALL, 2002
5. W. Bolton, "Programmable Logic Controller", 6th Ed., ELSEVIER NEWNES, 2015
6. Max Rabiee, "Programmable Logic Controllers – Hardware and Programing", 3rd Ed.,GOODHEART-WILLCOX CO, 2012

DNT333/3 Industrial Safety and Quality Management (Keselamatan Industri dan Pengurusan Kualiti)

This course gives an exposure to students to understand industrial safety standards and guidelines, quality management concept and various quality tools that allow students to understand the general picture of both areas which are being practiced by industries. At the end of this course, students are expected to be able to identify suitable quality techniques and tools to be implemented in production management and can apply Industrial Safety standards in real industrial environment.

Course Outcomes

CO1: Able to define and understand fundamentals of Industrial Safety and Quality Management
CO2: Able to apply techniques and tools of Quality Management
CO3: Able to evaluate safety issues and problems using Safety standards and tools
CO4: Able to demonstrate knowledge and apply the ethics.

References

1. David L. Goetsch, Quality Management for Organizational Excellence: – Introduction to Total Quality. 8th Ed., Pearson Prantice Hall, 2016.
2. C. Ray Asfahl, Industrial Safety and Health Management, 6th Ed., Pearson Prantice Hall, 2010.
3. David L. Goetsch, Occupational Safety and Health, for Technologists, Engineering, and Managers. 7th ed., Prentice Hall. 2011.
4. Willie Hammer, Dennis Price, Occupational Safety Management and Engineering. 5th ed., Prentice Hall. 2001.
5. Howard S. Gitlow *et. al*,Quality Management, 3rd ed., McGraw-Hill. 2005.

DNT351/3 Semestral Project (Projek Semestral)

This course is a semester-long project for final year diploma students. The project serves to demonstrate the skills and engineering knowledge acquired by the students throughout their studies. It also provides a platform to integrate practical knowledge with theory through group and individual work. The projects will be based on solving engineering problems which include understanding and identify the problems concerned, troubleshooting, fabrication work and come out with possible solution. Students are required to seek and discuss with supervisor about the problems concerns. This course offer soft skills building in communication skill and ability to share knowledge via presentation. Beyond that, student are capable to transfer knowledge in form of report writing at the end of semester.

Course Outcomes

CO1: Able to identify solution based on problem study.
CO2: Able to design engineering solution utilizing an engineering practice.
CO3: AblAble to perform an engineering project.
CO4: Able to write a technical report and communicate in oral presentation.

References

1. Semestral Project's Guideline for Diploma Engineering Programmes, UniMAP, 2008
2. Any publish material such as writing, multimedia or personal communication that related to the project topics

DNT3523 Industrial Automation and Robotics (Automatan Industri dan Robotik)

The objective of the course is to introduce practical robotics and automation technology in industrial applications. This course covers basic principles of robotics, classification of robots and mechanisms, components of robots, basic control systems, robot programming, intelligent systems and automation. Knowledge on theory acquired in lectures is also enhanced with practical work conducted in laboratory.

Course Outcomes

CO1: Able to identify type of robots and apply basic principles to robot applications.
CO2: Able to identify and apply different types of actuators, sensors and control systems of robots.
CO3: Able to explain the robotics applications, safety and to operate a simple automation systems.

References

1. Larry T. (Tim) Ross, Stephen W. (Steve) Fardo, and Michael F. Walach, "Industrial Robotics Fundamentals: Theory and Applications", Goodheart-Willcox Publisher, 2rd Edition, 2015.
2. Alenxander and Sadiku, "Fundamentals Of Electric Circuits", McGraw-Hill, 2007.
3. Nilsson and Riedel, "Electric Circuits", Pearson Prentice Hall, 2008.

DNT3543 Control Principles (Prinsip Kawalan)

This course provides students with a background of control principles in various engineering applications. Throughout this course, students will learn the basic mathematical tools such as Laplace transform, transfer function, block diagram, signal flow graph, mathematical modelling of dynamic systems, time response analysis, stability of linear system, root locus and frequency domain analysis. The laboratory will be used to aid the students understanding of the concept introduced.

Course Outcomes

CO1: Able to identify type of robots and apply basic principles to robot applications.
CO2: Able to identify and apply different types of actuators, sensors and control systems of robots.
CO3: Able to explain the robotics applications, safety and to operate a simple automation systems.

References

1. Alciatore, D.G., Histand, M.B., "Introduction to Mechatronics and Measurement Systems", 4th Edition, McGraw Hill, 2012.
2. Johnson, C.D., "Process Control Instrumentation Technology", 8th Edition, Pearson, 2013.
3. Nawrocki, Waldemar., "Measurement Systems and Sensors", 2nd Edition, Artech House Publishers, 2015.
4. Bakshi, U.A., Bakshi, A.V., "Electrical Measurements and Instrumentation", Technical Publications, 2014.
5. Alan S Morris, A.S., Reza Langari, R., "Measurement and Instrumentation: Theory and Application", 2nd Edition, Academic Press, 2015.
6. Ganji, A.R., Wheeler, A.J., "Introduction to Engineering Experimentation", 3rd Edition, Pearson, 2010.

DNT3553 Manufacturing Process (Proses-proses Pembuatan)

This course is an introduction of manufacturing processes and techniques used in industry to convert raw materials into finished or semi-finished part. This includes the study on the characteristics of manufacturing processes such as forming, casting, moulding, rapid prototyping, non-conventional machining and also fabrication of electronic devices. The influence of materials and processing parameters in understanding individual processes are also highlighted.

Course Outcomes

CO1: Able to choose raw materials for manufacturing processes.
CO2: Able to compare the manufacturing processes for a finished product.
CO3: Able to design proper machine techniques or methods to complete a particular manufacturing process .
CO4: Able to apply and demonstrate the knowledge in manufacturing process.

References

1. S.Kalpakjian, S.R.Schmid, "Manufacturing Engineering and Technology", 6th ed., Prentice Hall International, 2010.
2. Mikell P. Groover, "Fundamentals of Modern Manufacturing", 3rd ed. John Wiley & Sons, Inc., 2007.
3. Philip F. Ostwald, Jairo Munoz, "Manufacturing Processes and Systems", 9th ed., John Wiley & Sons, 1997.
4. E.Paul DeGarmo, J T. Black, Ronald A. Kohser, "Materials and Processes in Manufacturing", 9th ed., John Wiley & Sons, Inc., 2003.

PROGRAM KEJURUTERAAN

PEMBUATAN

PROGRAM DIPLOMA KEJURUTERAAN PEMBUATAN

PENGENALAN

Secara umumnya, struktur kurikulum bagi bidang kejuruteraan pembuatan dirangka agar ianya dapat mewujudkan keseimbangan antara bidang pengkhususan teknikal dan juga pengurusan industri. Keseluruhan kursus teras yang ditawarkan mendedahkan pelajar kepada aspek-aspek penting dalam industri pembuatan khususnya kepada pengetahuan dan kemahiran dalam teknologi pembuatan. Teknologi pembuatan memberi tumpuan kepada pemilihan rekabentuk, bahan, proses pembuatan, penggunaan mesin, serta pengurusan pengeluaran supaya produk yang dihasilkan dapat memenuhi kehendak pengguna dan kos yang minimum. Bagi program pengajian di peringkat Diploma Kejuruteraan ini, bilangan kredit yang diperlukan untuk menyempurnakan syarat penganugerahan Diploma Kejuruteraan ialah sebanyak 95 unit kredit, di mana 81 unit kredit adalah merangkumi kursus-kursus teras, manakala selebihnya 14 unit kredit adalah merangkumi kursus-kursus keperluan Universiti. Di samping itu, pelajar-pelajar tahun 3, semester pertama akan melaksanakan projek-projek yang berkaitan dengan program pengajian yang diikuti serta bersesuaian dengan keperluan industri. Selain itu, pelajar juga wajib menjalani Latihan Industri sekurang-kurangnya selama 16 minggu ketika berada dalam semester kedua, di tahun ketiga pengajian. Dengan adanya kemudahan makmal seperti Bilik Lukisan Kejuruteraan, Bengkel Proses Pembuatan, Kilang Mengajar, Makmal Pembuatan Termaju, Makmal Metrologi, Makmal Automasi, Makmal CAD/CAM, Makmal Termo-Bendalir di mana peralatannya setaraf dengan industri. Ini untuk melengkapkan pelajar-pelajar dengan pengetahuan dan kemahiran teknikal yang perlu di alam pekerjaan yang sebenar di industri-industri yang terpilih apabila pelajar telah memenuhi syarat untuk bergraduasi.

PROGRAM YANG DITAWARKAN

• Diploma Kejuruteraan Pembuatan

PELUANG KERJAYA

Graduan lulusan Diploma Kejuruteraan Pembuatan mempunyai peluang kerjaya yang amat cerah. Skop kerjaya sebagai seorang pembantu jurutera adalah luas dan mempunyai permintaan yang tinggi dari sektor swasta dan kerajaan. Peluang kerjaya yang ditawarkan oleh program ini adalah seperti berikut:

- Sebagai seorang pembantu jurutera di bahagian rekabentuk, proses pembuatan, kawalan kualiti, pengurusan, penyenggaraan, dan pengeluaran produk.
- Sebagai seorang pembantu jurutera yang mampu menyelesaikan sesuatu masalah yang melibatkan rekabentuk, proses dan pengeluaran di dalam industri pembuatan.
- Sebagai seorang pembantu jurutera dalam bidang penyelidikan dan pembangunan (R&D) di dalam sektor industi pembuatan atau kerajaan.

PROGRAM DIPLOMA KEJURUTERAAN PEMBUATAN

TAHUN	PERTAMA		KEDUA		KETIGA	
SEMESTER	I	II	I	II	I	II
Kursus Teras Kejuruteraan	DKA 104/2 Matematik Awalan	DQT101/3 Matematik I	DQT 102/3 Matematik II	DQT203/3 Matematik III	DPT351/3 Projek Semestral	DIT361/6 Latihan Industri
	DPT 104/3 Bahan	DPT 102/3 Statik dan Dinamik	DPT 203/3 Mekanik Bahan	DPT202/3 Themo-Bendalir	DPT 321/3 Rekabentuk Acuan Suntikan	
	DPT 114/3 Teknologi dan Amalan Kerja Tangan	DPT 115/3 Teknologi dan Amalan Pemesinan				
	DUT123/2 Kemahiran IT & Komunikasi	DPT 111/3 Proses Pembuatan 1	DPT 213/3 Proses Pembuatan 2	DPT 222/3 CAD/CAM	DPT 313/3 Kawalan Kualiti dan Metrologi	
	DPT 122/3 Lukisan Kejuruteraan dan Lukisan Berbantu komputer	DPT 123/2 Permodelan 3D CAD	DPT 224/3 Rekabentuk 1	DPT 225/3 Rekabentuk 2	DPT 335/2 Perancangan dan Kawalan Pengeluaran	
	DKT 121/3 Asas Pengatucaraan Komputer	DPT 152/3 Asas Teknologi Elektrik	DPT 251/3 Asas Elektronik	DPT 214/3 Sistem Pneumatik dan Hidraulik	DPT 315/3 Automasi Pembuatan dan Robotik	
81	14	17	15	16	14	6
Kursus Wajib Universiti	DVW410/2 Bahasa Melayu		DVW301/2 Bahasa Inggeris Komunikasi III		DUW224/2 Keusahawanan Kejuruteraan	
	DVW101/2 Bahasa Inggeris Komunikasi I	DVW201/2 Bahasa Inggeris Komunikasi II	DUW 239/2 Pengajian Malaysia II			
	DZWXXX/1 Badan Beruniform 1	DZWXXX/1 Badan Beruniform 2				
14	5	3	4		2	
95	19	20	19	16	16	6
TOTAL UNIT BERGRADUASI : 95 UNIT						
Nota : DKA 1042 Mathematik Awalan : Pra-Syarat Matematik 1 (DQT 1013) bagi yang mendapat gred D untuk Matematik Tambahan Peringkat SPM						

DPT 102/3
STATIK DAN DINAMIK (STATICS AND DYNAMICS)

Course Synopsis
This course is mainly divided into two parts; statics and dynamics. In statics, student will be exposed to the basic concepts of engineering mechanics such as forces, moments and friction. They will apply this basic knowledge to analyze the equilibrium of rigid bodies, as well as the stability of a structure. The subject of dynamics will be dealt in two parts: kinematics, which treats only the geometric aspects of the motion, and kinetics, which is the analysis of the forces causing the motion. Analysis regarding kinetic problems will be solved by using acceleration method, principle of work and energy, and principle of impulse and momentum

Course Outcome
By the end of the course, the students to:
1. Able to describe principles of physics for static: force, moment, Newton's First Law, Newton Third Law, trusses, frame and machine.
2. Able to apply principles in describing, sketching and/or drawing free body diagram and solving static problems.
3. Able to describe principles of physics for dynamics: kinematics, kinetics, Newton Second Law, position, velocity, acceleration, work, energy, impulse and momentum.
4. Able to apply principles in creating, sketching and/or drawing free body diagram and solving dynamic problems.

References
Text Book
1. Hibbeler, R.C., Engineering Mechanics Statics. 14th ed., Prentice Hall (2016)
2. Hibbeler, R. C., Engineering Mechanics Dynamics. 14th ed., Prentice Hall (2016)

References
1. Beer, F. B. and Johnston, E. R. Jr., \Vector Mechanics for Engineers: Statics and Dynamics. 11th ed., Canada, McGraw_Hill (2016)
2. Andrew Pytel, Jaan Kiusalaas, Engineering Mechanics: Statics and Dynamics. 4th ed., US,America (2015)
3. Beer and E.R. Johnson Jr., "Vector Mechanics tor Engineer: Statics 8th ed. In SI Units', McGraw Hill (2004).
4. Beer and E.R. Johnson Jr., "Vector Mechanics tor Engineer: Dynamics 8th ed. In SI Units', McGraw Hill (2004)
5. Meriam, J. L. and Kraige, L. G., Engineering Mechanics: Statics. 5th ed., USA, SI ver. Wiley (2003).
6. Meriam, J. L. and Kraige, L. G., Engineering Mechanics: Dynamics. 5th ed., USA, SI ver. Wiley (2003).

DPT 114/3
TEKNOLOGI DAN AMALAN KERJA TANGAN (TECHNOLOGY AND HANDWORK PRACTICE)

Course Synopsis
In this course, explanation about safety aspects in workshop will be given to the students. Then, they will be exposed to fundamental measurement technique, measurement equipment such as vernier caliper, micrometer, etc., followed by explanation on various basic cutting processes, e.g. filing, chiseling, sawing, etc. Students will be introduced to fabrication, sheet metal forming, and welding process which consists of introduction to basic knowledge of various cutting methods and hand tools, such as file, hacksaw, chisel, etc. The practices or lab sessions consist of briefly explanation on safety precautions in workshop, metrology lab, fitting work, sheet metal forming, and welding process.

Course Outcome
By the end of the course, the students to:
1. Able to illustrate different type of manual production process (craftsmanship, e.g.: filing, chiseling, manual sawing, sheet metal, etc.).
2. Able to choose various types of hand tools and equipment/instrument according to specifications and safety regulations
3. Able to CONSTRUCT a product.

References
Textbooks:
Steve F. Krar. Arthur R.Gill Smid. Technology of Machine Tools. 6th ed. Mc Graw Hill, 2007.

Reference Books:
1. Mikell P. Groover (2007). Fundumentals of Modern Manufacturing. 3rd ed. John Wiley & Sons.
2. S. Kalpakjian, S.R. Schmid. Manufacturing Engineering and Technology. 4th ed. Prentice Hall International 2001.
3. John A. Schey. Introduction to Manufacturing Process. Mc Graw Hill, 2000.

4. Zainal Abidin Ahmad. Proses Pembuatan. Jilid I UTM: Cetak Ratu Sdn. Bhd. 1999.
5. Zainal Abidin Ahmad. Proses Pembuatan. Jilid II UTM: Cetak Ratu Sdn. Bhd. 1999.
6. Philip F. Ostwald, Jairo Munoz. Manufacturing Processes and Systems. 9th ed., John Wiley & Sons, 1997.
7. E.Paul DeGarmo, J T. Black, Ronald A. Kohser. Materials and Processes in Manufacturing. 8th ed., John Wiley & Sons, Inc, 1997.

DPT 122/3
LUKISAN KEJURUTERAAN DAN LUKISAN BERBANTU KOMPUTER
(ENGINEERING DRAWING AND COMPUTER AIDED DRAFTING (CAD))

Course Synopsis
Objective of this course is to provide exposure and skills to Engineering Diploma student in basic Engineering Drawing, Computer Aided Drafting (CAD) and its engineering applications. The course will cover the detail of Engineering Drawing for beginners followed by projection systems and isometrics, before going on Computer Aided Drafting using AutoCAD software, which focus on product design in 2D and isometric. Knowledge in dimensioning and geometrical tolerance (GDT) will enhance student's ability in interpreting and assessing information from basic raw data of an engineering drawing.

Course Outcome
By the end of the course, the students:
1. Able to illustrate technical drawing and drafting using manual technique.
2. Able to apply principle in technical drawing and drafting using AutoCAD software.
3. Able to practice basic Geometric Dimensioning and Tolerancing (GDT) on technical drawing.

References
Textbooks:
Frederick E. Giesecke, Ivan Leroy Hill, Henry C. Spencer, Alva E. Mitchell, John Thomas Dygdon, Author, Technical Drawing with Engineering Graphics, 14th Edition, Pearson, 2014.

Reference books:
1. Frederik E. Giesecke, Alva Mithell, Hendry Cecil, Ivan Leyoy Hell, Robert Olin, John Thomas Dygdon & James E. Novak, "Engineering Graphics", 8th edition, P, 2004.
2. James H. Earle, "Engineering Design Graphics", llth ed.,Pearson Prentice-Hall, 2004.
3. R.K Dhawan, "Lukisan Mesin: Dalam Unjuran Sudut Pertama", Cetakan Pertama, Golden Books Centre Sdn. Bhd., 2002.
4. Frederick E. Giesecke, Henry Cecil Spencer, John Thomas Dygdon, Alva Mitchell, Ivan Leroy Hill, James E Novak, "Technical Drawing" 10th Ed., Prentice Hall, 2002.
5. M. R. Mainal, B. A Ghani & Y. Samian, "Lukisan Kejuruteraan Asas", Edisi Kedua, UTM Skudai, 2000.
6. Frederik E. Giesecke, Alva Mithell, Hendry Cecil, Ivan Leyoy Hell, Robert Olin, John Thomas Dygdon & James E. Novak, "Engineering Graphics", 8th edition, Pearson, 2004.

DPT 104
BAHAN (MATERIALS)

Course Synopsis
This course introduces students to the engineering materials fundamentals including the engineering materials application, atomic bonding, crystal structure, mechanical and physical properties, corrosion mechanism, microstructural analysis, phase diagram, ferrous and non-ferrous alloys, polymer and advance materials.

Course Outcome
By the end of the course, the students:
1. Able to analyse and evaluate transformation micro-structure and behaviors of ferrous, non-ferrous and polymer.
2. Able to analyse mechanical and corrosion properties of engineering materials.
3. Able to analyse advance and sustainable materials.

References
Textbooks:
William F. Smith, Javad Hashemi, 2006, Foundation of Materials Science and Engineering, Fifth edition, McGraw Hill

Reference book:
1. William D. Callister, Introduction to Materials, John-Wiley & Sons.
2. Budinski, K.G, 2006, Engineering Materials Properties and Selection, 8th edition, Prentice Hall.
3. Shackeford, J.F, 2005, Introduction to Materials Science for Engineers, 6th edition, Prentice Hall.
4. Mars G. Fontana, 1986, Corrosion Engineering, Third edition, McGraw Hill.

DPT 111 /3
PROSES PEMBUATAN I (MANUFACTURING PROCESS I)

Course Synopsis

This course explores the manufacturing process which used in industry to convert raw material into finished product. In the beginning, introduction to manufacturing technology will be given, followed by material selection in manufacturing and heat treatment process. Various metal casting processes will be introduced including sand casting, investment casting, vacuum casting and other casting processes. Overview of forming and shaping process will be given on rolling, forging, extrusion, drawing, sheet-metal forming, powder metallurgy, injection moulding, and rapid prototyping process. Besides that, this course also include various joining process such as brazing, soldering, adhesive bonding, and mechanical fastening processes. Including a practice of manufacturing process that is used in the industry to transform from raw material to finished products such as sand casting, vacuum casting, rapid prototyping, powder metallurgy, injection molding and heat treatment processes which covers introduction, processes and application. Practical work will help students to gain effective understanding.

Course Outcomes

By the end of the course, the students:

1. Able to illustrate the manufacturing process: Plastic Shaping, Metal Casting, Metal forming and Joining.
2. Able to develop different types of manufacturing processes to produce various products.

References

Text Book:

S. Kalpakjian, SR Schmid (2013), Manufacturing Engineering and Technology. 7th ed. Prentice Hall International

References Book:

1. Mikell P. Groover (2007), Fundamentals of Modern Manufacturing. 3rd ed. John Wiley & Sons Inc
2. John A.Schey, Introduction to Manufacturing Process, Mc Graw Hill
3. Phillip F. Ostwald, Jairo Munoz. Manufacturing Processes and Systems
4. E. Paul Degarmo. J T Black, Ronald A. Kohser. Materials and Processes n Manufacturing. John Wiley & Son, Inc.
5. Zainal Abidin Ahmad. Proses Pembuatan. Jilid I. UTM: Cetak Ratu Sdn. Bhd.
6. Zainal Abidin Ahmad. Proses Pembuatan. Jilid II. UTM: Cetak Ratu Sdn. Bhd.
7. Steve F.Krar, Arthur R.Gill, Peter Smid. Tecnology of Machine Tools.

DPT 115/3

TEKNOLOGI DAN AMALAN PEMESNAN (TECHNOLOGY AND MACHINING PRACTICE)

Course Synopsis

This course introduce about safety aspects in workshop and fundamental of measurement technique followed by milling, lathe and grinding operation which consists of introduction to basic knowledge of various cutting tools, parts of machine and its functions, machine operations, and numerous calculations involving the operations.

Course Outcome

By the end of the course, the students :

1. Able to illustrate different type of conventional machining operation such as milling, turning and grinding.
2. Able to operate lathe machine, milling machine and grinding machine and apply the safety precaution while working
3. Able to construct a product.

References

Text books: S. Kalpakjian, SR Schmid (2013), Manufacturing Engineering and Technology. 7th ed. Prentice Hall International

Reference books:

1. Mikell P. Groover (2007), Fundamentals of Modern Manufacturing. 3rd ed. John Wiley & Sons Inc
2. John A.Schey, Introduction to Manufacturing Process, Mc Graw Hill
3. Steve F.Krar, Arthur R.Gill, Peter Smid. Tecnology of Machine Tools.
4. Phillip F. Ostwald, Jairo Munoz. Manufacturing Processes and Systems

DPT 123/2
PERMODELAN 3D CAD (3D CAD MODELING)

Course Synopsis
This course focus on giving exposure and skill to students about basis of 3D modeling and its application in engineering field by using 3D Modeling software. This course include details on 3D modeling followed by producing 2D drawing, assembly drawing, exploded drawing, surface modeling, rendering and animation. All this skills will help student to apply its in engineering field to fulfill industry demand.

Course Outcome
By the end of the course, the students :
1. Design 3D model of components by using Unigraphics software.
2. Apply and produce technical/2D drawing using Unigraphics software.
3. Apply and produce assembly drawing and exploded drawing using Unigraphics software.
4. Apply and produce 3D animation and rendering for the components using Unigraphics software.

References
Text Book
Stephen M. Samuel, Basic to advanced NX6 modeling, drafting, and assemblies: a project oriented learning manual, Barnes & Nobel, 2008.

References

1. James H. Earle, "Engineering Design Graphics", IIth ed.,Pearson Prentice-Hall, 2004.
2. Frederick E. Giesecke, Henry Cecil Spencer, John Thomas Dygdon, Alva Mitchell, Ivan Leroy Hill, James E Novak, "Technical Drawing" 10th Ed., Prentice Hall, 2002.
3. R.K Dhawan, "Lukisan Mesin: Dalam Unjuran Sudut Pertama", Cetakan Pertama, Golden Books Centre Sdn. Bhd., 2002.
4. Frederik E. Giesecke, Alva Mithell, Hendry Cecil, Ivan Leyoy Hell, Robert Olin, John Thomas Dygdon & James E. Novak, "Engineering Graphics", 8th edition, Pearson, 2004.
5. A. N. Zulkifli, M. H. Omar & F. F. Mohamed, "Computer Aided Drafting", UUM.

DPT 152 /3
ASAS TEKNOLOGI ELEKTRIK (BASIC ELECTRICAL TECHNOLOGY)

Course Synopsis
This course is offered to non-electrical engineering background students. This course is intended to provide students with clear understanding the concepts and principles of the DC and AC circuits, basic principles of three phase ac circuits, and electromagnetism. The students will also gain an understanding of the basic operating principles of a transformer, calculate induced e.m.f, equivalent resistance, reactance and impedance, losses and transformer efficiency. At the end of the chapter, the students will understand the principles of DC Machines and three phase induction motors and do some basic calculation of losses and efficiency of DC Machines.

Course Outcomes
By the end of the course, the students :
1. Able to apply the terms, units, laws and theorems of basic electrical system.
2. Able to describe the concept and principle of single phase and three phase AC circuits parameters.
3. Able to describe the concept and principle of magnetic fields and the operation of transformer.
4. Able to develop the concept and principles used in DC machines and three phase induction motor.

References
Text Book:
Amarul Talip, Mohd Sazli Saad, Irfan Abdul Rahim, Mohd Fathullah Ghazli@ Ghazali, Mohd Khairul Fadzly Abu Bakar, Nur Ismalina Haris, Asas Teknologi Elektrik untuk Pelajar Mekanikal, UniMap, 2016
.
Reference Book:

1. John Bird, Electrical Circuit Theory and Technology, 2nd ed., Newnest, 2003.
2. Edward Hughes., Electrical and Electronic Technology. 8th ed. Prentice Hall, 2002.
3. Steven J Chapman, Electric Machinery Fundamentals., 5th ed. McGraw Hill, 2012.
4. Azyan Md Zahri, Nik Noor Zilawati Nik Ab Rahman, Nurismalina Haris, Amarul Talip, Asas Teknologi Elektrik, PTSS, 2016.
5. Charles K. Alexander, Matthew Sadiku, Fundamentals of Electric Circuits, International Edu.,McGraw Hill, 2nd ed., 2004.
6 V.K Mehta, Principles of Electrical Engineering and Electronics, S.Chand, 1996.

7. Floyd, Thomas L., Electrical Circuits Fundamentals, 8th Ed., Prentice Hall, 2010.
8. Eugene C. Lister, Robert J. Ruch, Electric Circuits and Machines, 7th ed, McGraw-Hill, 2000.

DPT 203/3
MEKANIK BAHAN (MECHANICS OF MATERIALS)

Course Synopsis
This course is designed to provide students with a clear presentation of both; the theory and application of the fundamental principle of mechanics of materials. Students are expected to acquire the knowledge of physical behaviour of materials under load and material behaviour requirement.

Course Outcome
By the end of the course, the students :
1. Able to apply concepts and principles of mechanics of materials.
2. Able to analyze and evaluate mechanical properties of specific materials of specific material; stress, shear, strain, axial loading, torsion and bending.

References
Text Book:
Hibbeler, RC (2013)., Mechanics of Materials, 9th Ed. Pearson

Reference Book:
1. Beer, J, Johnston E.R., and DeWolf, Mazurek, D(2015)., Mechanics of Materials, 7th Ed. McGraw-Hill
2. Barber, J.R (2010)., Intermediate Mechanics of Materials, Springer
3. Madhukar Vable (2007)., Mechanics of Materials, Oxford
4. Meriam, J.L. and Kraige, L.G, (2012)., Engineering Mechanics: Dynamics, 7th Ed., USA, Wiley
5. Beer, F.P, Mazurek, D and E.R. Johnston Jr., (2015)., Vectors Mechanics for Engineer: Statics, McGraw-Hill

DPT 214/3
SISTEM PNEUMATIK DAN HIDRAULIK (PNEUMATIC AND HYDRAULIC SYSTEMS)

Course Synopsis
This course will be exposing students about the fundamental of basic Pneumatic & Hydraulic Systems that are being practiced in Industry today. This course will be focusing on basic introduction which covers symbols, components, and circuits used in Pneumatic & Hydraulic Systems as well as its application in industry. To increase knowledge of students in this course, a practical approach will be done using the Pneumatic & Hydraulic equipments aided by computer software to construct the related circuits in Manufacturing Automation Lab. At the end of this course, the Pneumatic System application will be combined with Electro-Pneumatic System which uses electric power, relay, sensor and limit switch to move the components and actuator in Pneumatic System.

Course Outcome
By the end of the course, the students :
1. Able to describe concepts of Pneumatic & Hydraulic Systems.
2. Able to illustrate components and symbols of Pneumatic & Hydraulic Systems.
3. Able to design circuits of Pneumatic Systems that related to industrial applications.
4. Able to interpret the Electro-Pneumatic Systems applications.

References
Text Book:
Mohd Khairul Fadzly, Mohd Nasir Mat Saad, Shayfull Zamree Abd Rahim, Irfan Abd Rahim, Norshah Afizi Shuaib, Asas Sistem Pneumatik dan Hidraulik, Universiti Malaysia Perlis, 2015.

Reference Book:
1 P. Croser, J. Thomson, Electro-Pneumatics, Basic Level, Festo Didactic KG, D-7300 Esslingen 1, 1991.
2. Richard W Vockroth, Industrial Hydraulics, Delmar, 1994.
3. Igor L. Krivts, German V Krejnin, Pneumatics Actuating Systems for Automatic Equipment, Structure and Design, Taylor & Francis, 2006.
4. Khairur Rijal Jamaludin, Reka Bentuk Sistem Kuasa Bendalir, Universiti Teknologi Malaysia., 2004
5. John S. Cundiff, Fluid Power Circuits and Controls, Fundamentals and Applications., CRC Press. 2002.
6. Anthony Esposito, Fluid Power with Application, Fifth Edition, Prentice Hall, 2000.

7. James L. Johnson, Introduction to Fluid Power, Delmar, 2002.
8. Mikell P. Groover, Automation, Production Systems, and Computer-Integrated Manufacturing, 2nd ed., Prentice Hall, 2001.
9 P. Croser, J. Thomson, Pneumatics, Basic Level TP101 Textbook, Festo Didactic KG, D-7300 Esslingen 1, 1991.

DPT 224/3

REKABENTUK I (DESIGN I)

Course Synopsis

Design is an activity which needs to be well organized and take into account all influences that are likely to be responsible for the success of the product under development. Design is a creative process, requires knowledge, skill and imagination. When done well, it captivates us and inspires us. The content of this course covers basic concept of design, process and design technique, influence factors and product design phase. Other than that, sketching and design concept, design process, understand and conscious in consumer requirement. Furthermore, as a value added on student's understanding, the concepts of DFX, GDT, product economics, prototyping, report presentation, etc will be given.

Course Outcomes

By the end of the course, the students:

1. Able to describe principle concept and procedures of engineering design process.
2. Able to design engineering product by following methodology of engineering design process.
3. Able to construct prototype using handwork and machining skills.

References

Text Book:

Dieter G. E. Engineering Design, Mc Graw Hill, 4th ed, 2013.

Reference Book:

1. Rudolph J. Eggert, Engineering Design, Prentice Hall, 2005.
2. Ullman, D.G. The Mechanical Design Process. 2nd ed. McGraw Hill International Edition, 1997.
3. Dieter G. E. Engineering Design – A Materials and Processing Approach. Mc Gram Hill, 1991.
4. Juvinall R. C. Fundamental of Machine Component Design. John Wiley & Sons, 1983

DPT 202/3

TERMO_BENDALIR (THERMO-FLUID)

Course Synopsis

This course designed to provide a background on the fundamental principles and engineering applications of thermodynamics, heat transfer and fluid mechanics. These three areas collectively make up the field of thermal sciences but are traditionally taught as separate courses. However, in this course sequence, the three areas are presented in a more integrated manner, emphasizing the connectivity between these areas through the use of 'real-world' examples of thermal systems. The course begins with discussion on Basic concepts of thermodynamics, first law of thermodynamics. Then students will be discussing on topic Thermodynamics properties of liquids and solids. Course sequence of Heat Transfer and Fluid mechanics, topic is covered on mod of heat transfer (Conduction, Convection and Radiation) and then cover-up for fluid properties and fluid at rest. The fundamental laws, governing the motion of fluids are discussed next.

Course Outcomes

By the end of the course, the students:

1. Able to evaluate the principle of thermodynamic in selected area of study.
2. Able to analyse the principle of heat transfer in selected area of study.
3. Able to analyse the principle of fluid mechanic in selected area of study.

References

Text Book:

Yunus A. Cengel, John M. Cimbala, Robert H, Fundamentals of Thermal-Fluid Sciences, 4th ed., McGraw-Hill, (2012).

Reference Book:

1. Cengal, A. Y. and Boles, M. A., Thermodynamics: An Engineering Approch, 4th ed., McGraw-Hill, New York, (2001).
2. Massey, B. S., Mechanics of Fluid, 7th ed., Chapman & Hall, (1998).
3. Massoud, M., Engineering Thermofluids: Thermodynamics, Fluid Mechanics, and Heat Transfer: Springer Berlin Heidelberg, (2005).

DPT 213/3

PROSES PEMBUATAN II (MANUFACTURING PROCESS II)

Course Synopsis

This course exposes student the utilization of advanced machining processes. The course begins with overview to CNC machines, followed by CNC programming and CNC machines operation. Programming codes which include G, N, and M codes will be taught and student will perform basic geometry machining using those machines. Besides, students will also be exposed by the principles of operations and applications of other advanced manufacturing processes.

Course Outcomes

By the end of the course, the students:

1. Able to explain Computer Numerical Control (CNC) processes, tools related and control

systems.

2. Able to create, write/modify Numerical Control (NC) codes and operate CNC machine.
3. Able to distinguish the advance manufacturing processes and applications.

References

Text Book:

S.Kalpakjian, S.R Schmind (2013), Manufacturing Engineering and Technology. 7th ed. Prentice Hall International.

Reference Book:

1. Michael Fitzpatrick 1945, Machining and Computer Numerical Control Technology, 1st

Ed Dubuque, IA : McGraw-Hill , 2011.

2. Smid, Peter, 1930. CNC Programming Handbook: A Comprehensive Guide to Practical

CNC Programming, 3rd ed. New York: Industrial Press , 2008.

3. Jon Stenerson, Kelly Curran, Computer Numerical Control Operation and Programming.

3rd Edition, Prentice Hall, 2007.

4. Mikell P. Groover, Fundamentals of Modern Manufacturing, 3rd ed., John Wiley & Sons,

Inc., 2007.

5. James V. Valentino and Joseph Goldenberg. Introduction to computer numerical control

(CNC) / 3rd ed, Upper Saddle River, N.J: Prentice Hall, 2003.

6. Mattson, Mike, CNC programming: Principles And Applications, New York: Delmar/Thomson Learning, 2002.

7. P.N. Rao, CAD/CAM Principles and Applications, 2nd Edition, Mc. Graw Hill, 2002.

8. Smid, CNC Programming Handbook, 2nd ed., Industrial Press, 2002.

9. Steve Krar, Arthir Gill, Peter Smid, Computer Numerical Control Simplified, 1st ed., Industrial Press Inc. New York, 2001.

DPT 222/2

CAD/CAM (CAD/CAM)

Course Synopsis

This course introduce practical and application of CAD/CAM systems which enable students the theory, concepts and application of CAD/CAM in industry. Student will exposed to CAD software to illustrate parts and then using CAM software to convert CAD file into Numerical Control (NC) codes.

Course Outcomes

By the end of the course, the students:

1. Able to explain CAD/CAM system as part of product development process
2. Able to generate part programming for machining process based on CAD file.
3. Able to transfer part programming for Computer Numerical Control (CNC) machining.

References

Text Book:

S. Kalpakjian, S.R Schmid (2013), Manufacturing Engineering and Technology. 7th ed. Prentice Hall International

Reference Book:

1. Mikell P. Groover (2007), Fundamentals of Modern Manufacturing. 3rd ed. John Wiley & Sons Inc

2. John A.Schey, Introduction to Manufacturing Process, Mc Graw Hill

3. Steve F.Krar, Arthur R.Gill, Peter Smid. Tecnology of Machine Tools.

4. Phillip F. Ostwald, Jairo Munoz. Manufacturing Processes and Systems

5. E. Paul Degarmo. J T Black, Ronald A. Kohser. Materials and Processes n Manufacturing. John Wiley & Son, Inc.

DPT 225/3
REKABENTUK II (DESIGN II)

Course Synopsis
This course provides concept and understanding to allow students to find suitable designs for components in designing machine system, jig and fixtures. It focuses on basics of power transmission system, motors, fasteners and fundamental principles of jig and fixtures. Students will be exposed with simple design problems before being assigned to compute design parameters. At the end of this course, students will be analyzed simple designs of machine components by using CAD Aided Engineering (CAE) software.

Course Outcomes
By the end of the course, the students :
1. Able to apply fundamental components in designing machine elements: gears, belts, motors, jigs and fixtures.
2. Able to analyse simple design problems by using basic mechanical analysis.
3. Able to analyse simple design problems using CAE software.

References
Text Book:
1. Robert L. Mortt. Machine Elements in Mechanical Design. 5th Edition. Pearson Prantice Hall, 2015.
2. Edward G. Hoffman. Jig and Fixture Design. 4th Edition. Delmar Publishers, 1996.

Reference Book:
1. Norton, Robert L. Design of Machinery. 3rd Edition. McGraw-Hill, 2004.
2. Robert C. Juvinall and Kurt M. Marshek. Fundamental of Machine Components
3. Design. 4th Edition. John Wiley & Sons, 2005.
4. Richard Budynass, Joseph E. Shigley and Charles R. Mischke. Mechanical
5. Engineering Design. 7th Edition. McGraw-Hill, 2004.
6. Erik K.Henriksen. Jig and Fixture Design manual. Industrial Press INC, 1973

DPT 251/3
ASAS ELEKTRONIK (BASIC ELECTRONICS)

Course Synopsis
The purpose of this course is to give introduction and exposure to student about the electronic devices which includes analog and digital device. The analog device topic includes the introduction to basic electronic components, semiconductor, PN junction, diodes, zener diodes, bipolar junction transistor (BJT) and operational amplifier. The digital device topic includes the introduction to digital electronic binary number system, Boolean algebra, logic gates, logic circuits, Boolean function and combinational logic circuits. Students will be exposed to the electronic basic, operation concept, analysis method including the usage of electronic device used in industry. Lab test will also be done to clarify the topics learned in the class.

Course Outcomes
By the end of the course, the student :
1. Able to explain electronic component.
2. Able to develop electronic circuits.
3. Able to explain the application of electronic devices.

References
Text Book:
Mohd Sazli Saad, Amarul Talip, Mohd Fathullah Ghazli, and Nur Ismalina Haris, Elektronik asas : untuk pelajar mekanikal, 1st ed. UniMAP, 2015.

Reference Book:
1. Floyd, T.L., Electronic Devices. 8th ed. Prentice Hall, Inc, 2008.
2. Floyd, T.L., Digital Fundamentals, 11th ed. Prentice Hall, Inc, 2009.
3. Tocci, R.J. and, Widmer, N.S., Digital Systems: Principles and Applications. 9th ed. Prentice Hall, 2004.
4. Malvino , Electronic Principles , 7th ed , Macmillan/McGraw-Hill, 2007
5. Robert Boylestad , Louis Nashelsky , Electronic Devices and Circuit Theory , 11th ed.Prentice Hall,2013
6. Grob, Bernard, Basic Electronics, 8th ed., Glencoe/mcGraw-Hill, 1997
7. Rosenberg Paul, Basic Electronics, Wiley Publishing, 2005

DPT 315 /3
AUTOMASI PEMBUATAN DAN ROBOTIK (MANUFACTURING AUTOMATION AND ROBOTICS)

Course Synopsis
This course introduces the Manufacturing Automation and Robotic which been used in the industries today. Its covers topics regarding automation systems such as the pneumatic, hydraulic, programmable logic control (PLC), material handling, Automated Storage/Retrieval System (ASRS), Automated Guided Vehicles (AGV) and Automation Safety. Students are trained to design and programmed the programmable logic control (PLC) using PLC software. Robotic Course is an explanation of the classification, robot system, end-of-arm tooling, sensors, robot safety and robot utilization in the industries. There also an exposure regarding Combination of Modular Production System (MPS) with Automation and Robotic Systems.

Course Outcomes
By the end of the course, the students :
1. Able to explain the concept of Automation and Robotics in manufacturing Technologies applications.
2. Able to apply the concept of Automation, Material Handling and Robotics System in Manufacturing Systems application.
3. Able to evaluate concept of Programmable Logic Controller (PLC), end-of-arm tooling for industrial robotics and sensor devices for industrial applications.
4. Able to construct the automated system applications using PLC including timers, counter and sensor devices.

References
Text Book:
Mikell P. Groover, Automation, Production Systems, and Computer-Integrated Manufacturing, 3rd ed., Prentice Hall, 2008.

Reference Book:
1. Mohd Khairul Fadzly, Mohd Nasir Mat Saad, Shayfull Zamree Abd Rahim, Irfan Abd Rahim, Norshah Afizi Shuaib, Asas Sistem Pneumatik dan Hidraulik, Universiti Malaysia Perlis, 2015.
2. Jon Stenerson, Industrial Automation and Process Control., Prentice Hall, 2003.
3. Frank D. Petruzella, Programmable logic controllers, McGraw-Hill , 2005.
4. Amarul Talib, Mohd Khairul Fadzly, Asas Elektrik, Universiti Malaysia Perlis, 2015.
5. James A. Rehg, Glenn J. Sartori, Programmable Logic Controllers, Prentice Hall. New Jersey, 2007.
6. Jon Stenerson, Fundamentals of Programmable Logic Controllers, Sensors, and Communications, 3rd ed., Prentice Hall, 2004.

DPT 335/2
KAWALAN DAN PERANCANGAN PENGELUARAN (PRODUCTION PLANNING AND CONTROL)

Course Synopsis
This course addresses the production planning and control in manufacturing and service firm. The course introduces students to the fundamental concepts of modern production management and discusses its importance to the overall strategy and competitiveness of a firm. The students learn about the main approaches supporting the decision process in designing and operating the production and logistics system of an enterprise. Long-term, medium-term and short-term planning which includes forecasting, aggregate planning, materials requirement planning (MRP), lot sizing scheduling, project scheduling, supply chain management, inventory management, production planning, materials handling, JIT, Lean production system and human resources and job design are covered.

Course Outcome
By the end of the course, the students :
1. Able to Analyze cases or problems on Production Planning Systems by applying principle of Forecasting, Capacity Planning, Aggregate Planning and Process and Facility Layout.
2. Able to develop strategies based on cases or problems given on Production Management Systems by applying principle of inventory management, material requirement planning (MRP) and scheduling methods.

References
Text Book:
1. Jay Heizer, Barry Render, Chuck Munson (2017), Operations Management: Sustainability and Supply Chain Management, 12th Edition, USA
2. William J. Stevenson (2014), Operations Management, McGraw-Hill, New York, 12th Edition, USA

Reference Book:
1. Fred E. Meyers, Matthew P. Stephens. Manufacturing Facilities Design and Material Handling. Prentice Hall, 2013.

2. Niebel , Benjamin; Freivalds, Andris. Methods, Standards, & Work Design. 13th Edition, 2013.
3. Lee, J. Krajewski & Larry, P. Ritzman. Operations Management Strategy and Analysis, 6th ed.,Prentice Hall, 2002.

DPT 313/3

METROLOGI DAN KAWALAN KUALITI (METROLOGY AND QUALITY CONTROL)

Course Synopsis

This course divided into two sections first Metrology and second Quality Control. In Metrology section, students will expose with introduction the basic knowledge of metrology, measurement standards and tolerance in measurement. The students will be exposed to metrology equipment as vernier calliper, micrometer, profile projector, gage block, coordinate measuring machine (CMM) and surface roughness tester. It covers measurement techniques for reference plane, angle measurement and surface measurement. Practical work will help students to gain effective understanding. In Quality Control section, gives an exposure to students to understand the quality control tools. The students will be exposed the quality control tools as 7 tools quality control (old and new), total quality management (TQM), sampling and reliability. Beside that, the student will be exposed relationship between metrology and quality control in industry.

Course Outcome

By the end of the course, the students :

1. Able to apply the concepts, tools and techniques in linear measurement, angular measurement, surface measurement and coordinate measuring machine.
2. Able to differentiate different tools and techniques in quality control.
3. Able to develop quality tool base on the problem given in quality tool.

References

Text Book:

1. Besterfield, D. H. Quality Control. 7th Edition, Upper Saddle River; New Jersey, Pearson Prentice Hall, 2004.
2. Dotson, C.L. Fundamentals of Dimensional Metrology. 5th Edition, Unites States, Thomson Delmar Learning, 2006.

Reference Book:

1. Placko, D. Fundamentals of Instrumentation and Measurement, London, United Kingdom, ISTE, 2007.
2. DeSilva, G.M.S., Basic Metrology for ISO 9000 Certification, Delhi, India, Butterworth-Heinemann, 2002.
3 Wadsworth, H.M, Stephen & K.S, Godfrey A.B.Modern Methods for Quality Control and Improvement , Second Edition, John Wiley & Sons, Inc.,2002.
4. Sower V. E., Sovoie M. J., Renick S., An Introduction to Quality Management and Engineering, Prentice Hall, 1999.

DPT 321/3

REKABENTUK ACUAN SUNTIKAN (INJECTION MOULD DESIGN)

Course Synopsis

This course introduces students to basic knowledge of plastic injection mould. This module focuses on the actual step in designing mold starts with procedure in designing plastic products, procedure in designing plastic injection mould, analyses of material flow in plastic injection mould and translation of 3D data to CAM and continuing producing the assembly drawing of plastic injection mould to produce a plastic product.

Course Outcome

By the end of the course, the students should be able to:

1. Able to solve plastic injection moulding problem during process and designing part, and solve the part defect.
2. Able to analyse material flow behaviour and mould cost estimation.
3. Able to design gate, runner, air vent and cooling system in plastic injection mould.

References

Text Book:

Injection Mold Design Engineering (Second Edition), David O. Kazmer, Carl Hanser Verlag, Munich 2015.

Reference Book:

1. G. Boothroyd, P. Dewhurst, W. Knight, 'Product Design for Manufacture and Assembly', 2nd Edition, Marcel Dekker Inc., 2002.
2. K. Stoechert, "Gastrow Injection Molds: 108 Proven Design", 2nd. Edition, Hanser Publisher, New York, 1993.
3. R.J. Crawford, "Plastic Engineering", 2nd Edition, Pergamon Press, Unted Kingdom, 1990.
4. L. Sors and I. Balazs, "Design of Plastic Moulds and Dies", Elsevier, Amsterdam, 1989.

DPT 351/3
SEMESTRAL PROJECT

Course Synopsis

This course is implemented in individual or groups (maximum of 3 students per group) and should be completed in one semester period. The group should finished their project based on the human's life problem statement in engineering field which consists of design, mechanical, manufacturing, automation, electric and electronic. Besides that, each group will discuss with their project supervisor based on project's title and proposal paper, final report, log book, presentation and finished work (product).

Course Outcomes

By the end of the course, the students should be able to:

1. Able to identify solution based on problem study.
2. Able to design engineering solution utilizing an engineering practice.
3. Able to construct a product.
4. Able to write a technical report and communicate in oral presentation.

References

1. Semestral Project's Guideline for Diploma Engineering Programmes, UniMAP, 2008.
2. Suitable reference (book, journal, internet, news paper, etc) for semestral project's.

PUSAT PENGAJIAN
PEMBANGUNAN INSAN DAN
TEKNOKOMUNIKASI

iKOM

Pusat Teknologi Komunikasi dan Pembangunan Insan (PTKPI) yang dahulunya dikenali sebagai Pusat Kemahiran Komunikasi dan Keusahawanan (PKKK) berfungsi sebagai satu Pusat Khidmat (Service Centre) yang dipertanggungjawabkan menguruskan kursus-kursus wajib universiti pada masa ini.

Menjelang tahun 2014, PTKPI mengorak langkah lebih maju dengan menawarkan satu program baharu iaitu Ijazah Sarjana Muda Komunikasi Media Baharu. Sehubungan itu, PTKPI telah dinaiktaraf sebagai sebuah Pusat Pengajian yang dikenali sebagai Pusat Pengajian Pembangunan Insan dan Teknokomunikasi (iKOM) berkuatkuasa pada 1 April 2014. Di samping itu, Pusat Kaunseling juga diletakkan sebagai cabang di bawah iKOM.

Selain menawarkan kursus-kursus yang membawa kepada penganugerahan diploma atau ijazah, iKOM juga menawarkan program pada peringkat pascasiswazah iaitu Teknologi Maklumat dan Komunikasi, Psikologi dan Kaunseling, Keusahawanan Sosial serta Pendidikan dan Sains Sukan.

Pada 1 Julai 2014, operasi pentadbiran Radio UniMAP iaitu UniMAP fm telah diletakkan di bawah seliaan dan tanggungjawab iKOM.

KURSUS KEPERLUAN / WAJIB UNIVERSITI

Pelajar-pelajar program diploma perlu mengumpul 6 unit daripada kursus yang ditawarkan oleh Ikom mengikut pembahagian seperti berikut:

KURSUS	
WAJIB UNIVERSITI	6 unit

KURSUS - KURSUS YANG DITAWARKAN

DUT123/2	Kemahiran dan Teknologi Dalam Komunikasi
DUW224/2	Keusahawanan Kejuruteraan
DUW239/2	Pengajian Malaysia II

VISI

Menjadi pusat perkembangan ilmu sains sosial, komunikasi, teknologi maklumat, dan kemahiran insaniah dalam arena antarabangsa yang kompetitif.

MISI

Membentuk insan berintelek, berpersonaliti, unggul, berfikiran kreatif dan inovatif, berdaya saing dan berketrampilan melalui pencerapan ilmu dan kemahiran insaniah melalui pembelajaran berkualiti, bertunjangkan aspirasi universiti.

ALAMAT:

PUSAT PENGAJIAN PEMBANGUNAN INSAN DAN TEKNOKOMUNIKASI (iKOM)
Universiti Malaysia Perlis (UniMAP)
Kompleks Pusat Pengajian UniMAP (Blok B),
Jalan Kangar – Arau
02600 Jejawi, Arau, Perlis

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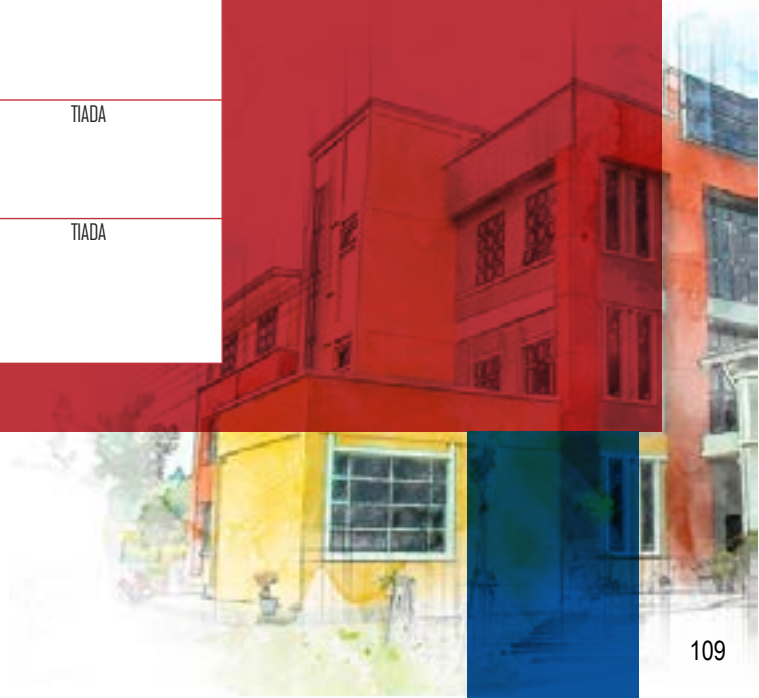
SENARAI KURSUS WAJIB UNIVERSITI

Setiap pelajar perlu mengumpul 6 unit wajib universiti seperti yang dinyatakan di atas dengan mengambil senarai kursus seperti di bawah:

KURSUS KEPERLUAN UNIVERSITI		
Nama Kursus	Kod Kursus	Unit
a. Pengajian Malaysia II	DUW 239/2	2
b. Keusahawanan Kejuruteraan	DUW 224/2	2
c. Teknologi Maklumat dan Kemahiran Komunikasi	DUT 123/3	2

Bagi membantu pelajar mendaftar kursus wajib universiti secara lebih terancang pihak iKOM berinisiatif menyediakan jadual pendaftaran kursus mengikut program dan semester.

TAHUN	NAMA KURSUS (KOD)	SEMESTER 1	SEMESTER 2
PERTAMA	Kemahiran dan Teknologi Dalam Komunikasi (DUT123)	▪ R2420 ▪ R2427 ▪ R2423 ▪ R2404 ▪ R2432	▪ R2433
KEDUA	Keusahawanan Kejuruteraan / Engineering Entrepneurship (DUW224)	▪ R2420	TIADA
	Pengajian Malaysia II (DUW239)	▪ R2420 ▪ R2433 ▪ R2423 ▪ R2404 ▪ R2432	TIADA
	Keusahawanan Kejuruteraan / Engineering Entrepneurship (DUW224)	▪ R2427	TIADA
KETIGA	Pengajian Islam II (DUW239)	▪ R2427	TIADA
	Keusahawanan Kejuruteraan / Engineering Entrepneurship (DUW224)	▪ R2420 ▪ R2423 ▪ R2433 ▪ R2432	TIADA



INSTITUT
MATEMATIK
KEJURUTERAAN

IMK

PENGENALAN

Institut Matematik Kejuruteraan (IMK) UniMAPadalah sebuah pusat bagi merancang penawaran dan pemantauan kurikulum matematik kejuruteraan di UniMAP. IMK juga berperanan sebagai institut penyelidikan matematik kejuruteraan dan juga sebagai pusat rujukan dan memberi khidmat kepakaran dalam bidang kaedah penyelidikan matematik, simulasi, kaedah statistik dan penyelidikan operasi. IMK juga sebagai pusat latihan bagi masyarakat kampus dan luar kampus dalam bidang yang berkaitan dengan matematik.

KURSUS-KURSUS YANG DITAWARKAN

Kursus Diploma

DQT101/3 Mathematics I
DQT102/3 Mathematics II
DQT203/3 Mathematics III

ALAMAT RASMI PPK/PTJ

INSTITUT MATEMATIK KEJURUTERAAN (IMK)
Aras Bawah, Bangunan Pentadbiran Pusat Kejuruteraan & Inovasi
Universiti Malaysia Perlis (UniMAP)
Kampus Tetap Pauh Putra
02600 Arau, Perlis

No.Tel : 04-9885702/5705
No.Faks: 04-9885703

Laman Web: https://imk.unimap.edu.my/v2/

PUSAT BAHASA ANTARABANGSA

PENGENALAN

Pusat Bahasa Antarabangsa, dahulunya dikenali sebagai Jabatan Bahasa Antarabangsa, ditubuhkan pada 1 Mac, 2013. Tujuan penubuhan pusat ini adalah untuk memberi peluang kepada para pelajar, kakitangan Universiti Malaysia Perlis, dan masyarakat tempatan untuk mempelajari serta mendalami bahasa.

Kini, PBA menawarkan kursus-kursus bahasa keperluan Universiti kepada semua pelajar UniMAP pada peringkat diploma dan peringkat ijazah sarjana muda. PBA sentiasa berusaha untuk memenuhi keperluan pelajar- pelajar yang ingin mahir bukan sahaja dalam Bahasa Melayu dan Bahasa Inggeris, tetapijuga dalam bahasa ketiga pilihan mereka. Selain daripada Bahasa Melayu dan Bahasa Inggeris, bahasa-bahasa lain yang ditawarkan ialah Bahasa Arab, Bahasa Mandarin, Bahasa Thai, Bahasa Jepun, Bahasa German dan Bahasa Korea.

Di samping itu, PBA memberi penekanan untuk melengkapkan pelajar-pelajar UniMAP dengan kemahiran berbahasa dan kemahiran-kemahiran lain yang amat penting dalam era pengetahuan dan ekonomi berasaskan inovasi. Melalui kursus- kursus bahasa yang ditawarkan, PBA sedang berusaha untuk mengasah 'kemahiran berbahasa abad ke-21' dalam kalangan pelajar dan pelanggan untuk menyokong dan memupuk mereka supaya menjadi individu yang berdaya usaha serta dapat menyumbang secara positif dalam dunia pekerjaan.

PBA turut menyokong pembelajaran pelajar melalui penyediaan khidmat nasihat bahasa dan sentiasa bersedia untuk memastikan para pemegang taruh memperoleh perkhidmatan yang terbaik.

KURSUS- KURSUS YANG DITAWARKAN:

BIL	NAMA KURSUS	KOD KURSUS	UNIT
1.	Bahasa Inggeris Komunikasi I	DVW101	2
2.	Bahasa Inggeris Komunikasi II	DVW201	2
3.	Bahasa Inggeris Komunikasi III	DVW301	2
4.	Bahasa Melayu	DVW410	2

ALAMAT:

PUSAT BAHASA
ANTARABANGSA Universiti
Malaysia Perlis,
Jalan Ulu Pauh, Kampung
Tengah, Ulu Pauh, 02600,
Pauh, Arau, Perlis, MALAYSIA

TEL: 04-9871344
FAKS: 04-9871340

PUSAT KEJURUTERAAN

PENGENALAN

Objektif penubuhan Pusat Kejuruteraan adalah untuk menawarkan kemudahan kepada kursus-kursus yang berteraskan latihan dan kemahiran teknikal di samping menyediakan kemudahan untuk aktiviti-aktiviti penyelidikan dan pembangunan produk. Konsep 'Teaching Factory' yang diperkenalkan di Pusat Kejuruteraan adalah untuk memberi pendedahan awal kepada pelajar suasana bekerja di industri. Di samping itu juga, hampir kesemua peralatan/ mesin di sini adalah teknologi terkini di industri.

Pusat Kejuruteraan juga menawarkan kursus teras pada peringkat diploma iaitu:

- DCT100 Basic Engineering Skills / Kemahiran Asas Kejuruteraan

ALAMAT:

Fakulti Teknologi Kejuruteraan
Universiti Malaysia Perlis
Pusat Kejuruteraan, Aras 1, Bangunan Pentadbiran
Kampus Pauh Putra
02600 Arau, Perlis

Tel: (04) 988 5712
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PUSAT KOKURIKULUM

PENGENALAN

Dahulunya, Unit Kokurikulum UniMAP ditubuhkan pada tahun 2002 dan diletakkan di bawah Pusat Kemahiran Komunikasi dan Keusahawanan (PKKK). Pada tanggal 3 Ogos 2008, Jabatan Pengajian Tinggi telah mengarahkan Pusat Kokurikulum ditubuhkan di semua Institusi Pengajian Tinggi Awam (IPTA) Malaysia. Hasrat Ini bertujuan mencapai matlamat seperti yang digariskan dalam Pelan Strategik Pengajian Tinggi Negara (PSPTN) bagi memperkasakan learning outcome melalui aktiviti kokurikulum.

Pusat Kokurikulum mula beroperasi pada tarikh 8 Jun 2010 dan pelancaran penubuhannya telah disempurnakan oleh Y. Bhg. Dato' Naib Canselor UniMAP. Pusat Kokurikulum juga telah diberi satu bangunan khusus untuk beroperasi dengan menempatkan seramai 10 orang kakitangan pentadbiran untuk menerajui Pusat Kokurikulum.

Di bawah Pusat KoKurikulum terdapat kursus-kursus Badan Beruniform dan Kokurikulum. Bagi pelajar Diploma adalah diwajibkan untuk mengambil lima (2) Unit . Pusat Kokurikulum telah menawarkan sebanyak tujuh (7) kursus Badan Beruniform untuk dipilih oleh pelajar-pelajar Diploma tanpa mengira program akademik yang diambilnya sebagai syarat untuk bergraduat.

ALAMAT:
PUSAT KOKURIKULUM
Universiti Malaysia Perlis
Kompleks Pusat Pengajian Jejawi 4,
02600 Arau, Perlis, MALAYSIA
Tel: +04 – 9797908/7909/7910/7911/7913
Faks : +04 – 9797907

Pelajar-pelajar program diploma perlu mengumpul 2 unit daripada kursus yang ditawarkan mengikut pembahagian seperti berikut sepanjang pangajian.

BIL	SENARAI KURSUS	KOD KURSUS	TAHUN /SEMESTER	UNIT	PRA SYARAT PENDAFTARAN
1	Kumpulan Latihan KelanaSiswa Malaysia I (KLKM I) [Malaysian University Rover Training Group I (MURTG I)]	DZW111	TAHUN 1 / SEM I	1	Tiada
	Kumpulan Latihan KelanaSiswa Malaysia II (KLKM II) [Malaysian University Rover Training Group II (MURTG II)]	DZW112	TAHUN 1 / SEM I	1	Lulus kursus DZW111
2	Briged Bomba dan Penyelamat I [Fire and Rescue Briged I]	DZW113	TAHUN 1 / SEM I	1	Tiada
	Briged Bomba dan Penyelamat II [Fire and Rescue Briged II]	DZW114	TAHUN 1 / SEM II	1	Lulus kursus DZW113
3	Bulan Sabit Merah Malaysia I (BSMM I) [Malaysian Red Crescent I (MRC I)]	DZW115	TAHUN 1 / SEM I	1	Tiada
	Bulan Sabit Merah Malaysia II (BSMM II) [Malaysian Red Crescent II (MRC II)]	DZW116	TAHUN 1 / SEM II	1	Lulus kursus DZW115
4	Pertahanan Awam I [Civil Defense I]	DZW117	TAHUN 1 / SEM I	1	Tiada
	Pertahanan Awam II [Civil Defense II]	DZW118	TAHUN 1 / SEM II	1	Lulus kursus DZW117
5	Pandu Puteri Siswi I (PPS I) [Girl Guide I (PPS I)]	DZW119	TAHUN 1 / SEM I	1	Tiada
	Pandu Puteri Siswi II (PPS II) [Girl Guide II (PPS II)]	DZW120	TAHUN 1 / SEM II	1	Lulus kursus DZW119
6	St. John Ambulans Malaysia I [Malaysian St.John Ambulance I]	DZW121	TAHUN 1 / SEM I	1	Tiada
	St. John Ambulans Malaysia II [Malaysian St.John Ambulance II]	DZW122	TAHUN 1 / SEM II	1	Lulus kursus DZW121
7	Pancaragam I [Brassband I]	DZW123	TAHUN 1 / SEM I	1	Tiada
	Pancaragam II [Brassband II]	DZW124	TAHUN 1 / SEM II	1	Lulus kursus DZW123

PUSAT KERJASAMA INDUSTRI DAN AGENSI KERAJAAN (CIGC)

Pusat Kerjasama Industri dan Agensi Kerajaan (CIGC) berfungsi sebagai pusat penghubung di antara UniMAP, industri dan agensi kerajaan. Peranan utama pusat ini adalah untuk mentadbir proses keseluruhan perkara yang berkaitan dengan latihan industri pelajar, jaringan industri (termasuk perjanjian persefahaman) serta kebolehpasaran graduan. Di samping itu, pusat ini juga turut bertindak sebagai penganjur serta penyelaras bagi program-program di peringkat universiti bagi meningkatkan lagi kebolehpasaran graduan di kalangan pelajar UniMAP. Untuk memainkan peranannya dengan lebih berkesan, Pusat Kerjasama Industri dan Agensi Kerajaan ini secara konsistennya akan menerokai potensi-potensi kerjasama yang tinggi dengan industri dan agensi kerajaan bagi tujuan akademik, penyelidikan dan pembangunan, kebolehpasaran graduan serta program latihan industri.

KURSUS DITAWARKAN

DIT361/6 INDUSTRIAL TRAINING

ALAMAT RASMI PPK/PTJ

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