

**DIPLOMA IN MECHANICAL ENGINEERING  
WITH TECHNOLOGY (DDT)**

**Diploma in Mechanical Engineering With Technology**  
**Faculty of Mechanical and Manufacturing Engineering**

YEAR	CODE	SEMESTER I	CREDIT	CODE	SEMESTER II	CREDIT	CODE	SEMESTER III	CREDIT
		SUBJECTS			SUBJECTS			SUBJECTS	
1	UMS 1133	Pengantar Kenegaraan dan Pembangunan Malaysia/	3	UMA 1172	Pengantar Pengajian Islam/	2			
	UMS 1143	Malaysia Studies and Culture		UMA 1142	Pengajian Moral				
	UMB 1112	Technical Communication I	2	UMB 1122	Technical Communication II	2			
	UQ* 1**1	Co-curriculum	1	UM* 1312	Foreign Language	2			
	DSM 1913	Mathematics I	3	DSM 1923	Mathematics II	3			
	DSF 1963	Physics I	3	DSF 1973	Physics II	3			
	DSK 1913	Chemistry	3	DDA 1013	Static	3			
	<b>DD* 1013</b>	<b>Technology Practice * I</b>	<b>3</b>	<b>DD* 1023</b>	<b>Technology Practice * II</b>	<b>3</b>			
	UMB 1011	English For Academic Purposes	1						
			<b>19</b>			<b>18</b>			
2	UMA 3032	Akidah Ketuhanan & Sains	2	DSM 2913	Mathematics III	3			
	DDA 2012	Suopervisory Skills	2	DDA 2092	Dynamics	2			
	DDA 3052	Engineering Drawing	2	DDA 2063	Mechanics of Solids	3			
	DDA 2022	Thermodynamics	2	DDA 2073	Engineering Materials Selection	3			
	DDA 2033	Engineering Laboratory I	3	DDA 2721	Engineering Laboratory II	1			
	DDA 2711	Safety Engineering and Maintenance	1	<b>DD* 2023</b>	<b>Technology Practice * IV</b>	<b>3</b>			
	DDA 2043	Material Science	3	DDD 2**3	Technology Elective * I	3			
	<b>DD* 2013</b>	<b>Technology Practice * III</b>	<b>3</b>						
			<b>18</b>			<b>18</b>			
3	DDA 3023	CAD	3	DTI 2143	Pengaturcaraan komputer	3			
	DSM 2932	Engineering Statistics	2	DDA 3013	Industrial Engineering Design	3			
	DDA 3033	Fluid Mechanics	3	DDA 3913	Engineering Technology Project	3	DDA	Industrial Training (3 months/ 12 weeks)	6
	DDA 3711	Engineering Laboratory III	1	DPK 2013	Asas Perniagaan & Keusahawanan	3	3816		
	DDA 3043	Mechanics of Machines	3	DKE 3173	Asas Elektrik & Elektronik	3			
	DDD 2**3	Technology Elective * II	3	DD* 2**3	Technology Elective * IV	3			
	DD* 2**3	Technology Elective * III	3						
			<b>18</b>			<b>18</b>			
<b>TOTAL CREDIT</b>									<b>115</b>

**SUBJECTS FOR TECHNOLOGY PRACTICE**

Kod	Mata Pelajaran	Kod	Mata Pelajaran
DDE 1013 / 1023 / 2013 / 2023	Automotive Technology Practice I / II / III / IV	DDF 1013 / 1023 / 2013 / 2023	Plant Technology Practice I / II / III / IV
DDB 1013 / 1023 / 2013 / 2023	Textile Technology Practice I / II / III / IV	DDC 1013 / 1023 / 2013 / 2023	Packaging Technology Practice I / II / III / IV
DDD 1013 / 1023 / 2013 / 2023	Manufacturing Technology Practice I / II / III / IV		

**AUTOMOTIVE ELECTIVE**

KOD	MATA PELAJARAN	KREDIT
DDE 2033	Chassis System	3
DDE 2043	Transmission and Tramsaxle System	3
DDE 2053	Automotive Workshop Managemant	3
DDE 2063	Electric and Computer Control In Automotive	3
DDE 2073	Internal Combustion Engine	3
DDE 2083	Vehicle Air-Conditioning	3
DDE 2093	Combustion and Emission Control	3

**TEXTILE ELECTIVE**

KOD	MATA PELAJARAN	KREDIT
DDB 2033	Yarn Technology	3
DDB 2043	Weaving Technology	3
DDB 2053	Knitting Technology	3
DDB 2063	Textile Dyeing & Finishing Technology	3
DDB 2073	Non Woven, Printing & Embroidery Technology	3
DDB 2083	Textile Testing	3

**MANUFACTURING ELECTIVE**

KOD	MATA PELAJARAN	KREDIT
DDD 2033	Rekabentuk dan CAE	3
DDD 2043	Metrologi & Pengukuran	3
DDD 2053	Kawalan Kualiti	3
DDD 2063	Pneumatik & Hidraulik	3
DDD 3323	Tuangan Logam	3
DDD 3623	Prototaip Deras	3

**PLANT ELECTIVE**

KOD	MATA PELAJARAN	KREDIT
DDF 2033	Safety Engineering	3
DDF 2043	Boiler Safety	3
DDF 2053	Plant Engineering	3
DDF 2063	Process Control Systems of Steam Power Plant	3
DDF 2073	Applied Thermodynamics	3
DDF 2083	Air Conditioning System Design	3

**PACKAGING ELECTIVE**

KOD	MATA PELAJARAN	KREDIT
DDC 2033	Principles of Packaging Engineering	3
DDC 2043	Packaging Machinerics and Operation	3
DDC 2053	Paper Packaging System	3
DDC 2063	Plastic, Glass and Metal Packaging System	3
DDC 2073	Packaging Dynamic & Distribution	3
DDC 2083	Packaging Development System	3

**YEAR 1**



**UMB 1112**

**TECHNICAL COMMUNICATION I**

**SYNOPSIS :**

This course introduces students to report writing skills needed at tertiary level. Students will learn basic report writing skills such as proposals, progress report and analytical report. In order to do this, they will learn how to collect data using questionnaires. Prior to that, students will also be trained to polish up their skills in definitive and descriptive essays using accurate grammar, vocabulary and sentence structure.

**REFERENCES :**

1. Finkelstein, J. (2008). Pocket Book of technical writing. 3rd ed. Singapore: McGraw Hill.
2. Kolin, P. C. (2006). Successful writing at work. Concise ed. USA:Houghton Mufflin Company.
3. Salbiah Seliman et. al. (2004). English Communication for learners in engineering. Malaysia: Prentice Hall.
4. Lakshmy Anantha Krishnan et. al. (2003). Engineering your report: From start to finish. Singapore: Prentice Hall.
5. Gerson, S. J. & Gerson, S. M. (2003). Technical writing: Process and product. 3rd ed. New Jersey: Prentice Hall.
6. Eisenberg, A. (1992). Effective technical communication. 2<sup>nd</sup> ed. New York: McGraw Hill.
7. Dorothy Cheung et. al. (1999). Report writing for engineering students. 2<sup>nd</sup> ed. Singapore: Prentice Hall

**UQ\* 1\*\*1**

**CO-CURRICULUM**

**SYNOPSIS :**

Matapelajaran ini ditawarkan dalam bentuk pelbagai aktiviti pilihan untuk pelajar peringkat Sarjana Muda dan Diploma. Tiga bidang aktiviti yang ditawarkan adalah Sukan & Rekreasi, Kelab/Persatuan dan Persatuan Beruniform.

## DSM 1913                      MATHEMATICS I

### SYNOPSIS :

**Real Number** : Set for real numbers, exponent, logarithm and radicals. **Inequalities and Absolute Value**. **Polynomial** : Introduction, quadratics equation, numerical methods solving non-linear equations : bisection and secant methods, partial fraction. **Sequence and Series** : Sequence and arithmetic, sequence and geometric series, binomial series. **Trigonometry** : Trigonometric ratios of acute angles and arbitrary angles, trigonometric equation. **Function** : Relation and function, graph, algebra function, piecewise function, trigonometry, exponent, logarithm, hyperbolic and its inverse. **Statistics** : Definition of data (mean, mode, median), measurement of ungrouped and group data dispersion(range, mean deviation and standard deviation). **Probability** : Independent and conditional event, Bayes theorem.

### REFERENCES

1. Stroud, K. A., Booth, D.J. (2007) *Engineering Mathematics*. 6<sup>th</sup> Ed. US: Palgrave Macmillan.
2. Anton, H., Bivens, I., Davis, S. (2005) *Calculus*. 8<sup>th</sup> Ed. USA: John Wiley & Sons, Inc.
3. K. Bayn Martin – Gay (1993) *Intermediate Algebra*. Prentice Hall, Englewoods Cliffs.
4. Thomas, G. B., Finney, R. L. (1996) *Calculus and Analytic Geometry*. 9<sup>th</sup> Ed. USA: Addison- Wesley Publishing Company.
5. Walpole E.R, Myers R.H, Myers S. L. (1998) *Probability And Statistics* 6<sup>th</sup> Ed.USA : Prentice Hall, New Jersey.
6. Abd. Wahid Md Raji et al. (2000) *MATHEMATICS Asas*, Jilid I & II., Jabatan MATHEMATICS, Fakulti Sains, UTM.

## DSF 1963                      PHYSICS I

### SYNOPSIS :

**Measurement and Unit**: Measurement, base quantity, derived quantity, unit and dimension, definition of standard, scientific notation, order of magnitude estimation, conversion of unit, significant figures in addition, subtraction, multiplication and division. **Vector**: Introduction to vector, addition and resultant of vector, resolving vector. **Linear and Rotational Kinematics**: Concept of position, distance, displacement, speed, velocity and acceleration,

distance-time graph and velocity-time graph, linear motion with constant velocity, linear motion with constant acceleration, free fall motion, projectile motion. **Rotational Motion:** Angular displacement, angular velocity, angular acceleration and rotational motion equation with constant angular acceleration. **Particle Dynamics:** Newton's First Law and Inertia, Newton's Second Law and concept of mass, weight and momentum. Newton's Third Law and normal force and reaction, resultant of forces acted on a body, free-body diagrams, dynamics of motion of body on horizontal, incline and vertical plane, centripetal force. **Work, Power and Energy:** Principal of work-energy and principal of conservation of energy, linear momentum and impulse. **Simple Harmonic Motion:** Restoring force, definition and equation of SHM (displacement, velocity and acceleration), examples of SHM, simple pendulum and spring-mass system, energy of SHM, concept of free oscillations, damped oscillations, forced oscillations and resonance. **Physic Laboratory:** Related to the topics in DSF 1963.

## REFERENCES

1. Giambattista, A., Richardson, B. M., Richardson, R. C. (2007) *College Physics* 2<sup>nd</sup> Ed. New York: Mc Graw Hill.
2. Serway, R. A., Faughn, J. S., Moses, C. J. (2003) *College Physics*. 6<sup>th</sup> Ed. USA: Pacific Grove, CA: Thomson Learning.
3. Bueche, F. J., Hecht, E., Hademenos, G. J. (2000) *College Physics: Based on Schaum's Outline of College Physics*. New York: McGraw-Hill.
4. Urone, P. P. (2001) *College Physics*. 2<sup>nd</sup> Ed. USA: Pacific Grove, CA: Brooks/Cole.

DSK 1913

CHEMISTRY

## SYNOPSIS :

**Atomic Concept and Mole:** Matter and states of matter (element, pure compound, mixture). Definition and naming of atoms, molecules and ions. Atomic, molecular and molar mass. Chemical equation and stoichiometry. Solution concentration and volumetric analysis. **Electronic Structure of Atom:** Bohr's Atomic Theory. Quantum numbers and electron configuration. **Periodic Table of Elements:** Classification and periodic properties. **Chemical Bonding:** Lewis structures. Ionic and covalent bond. Intermolecular forces. **Gas Laws:** Particles in gas. Gas laws. **Thermochemistry:** Enthalpy and enthalpy change. Hess's law. **Chemical Kinetics:** Rate of reaction and rate law. Effect of temperature, concentration, pressure and



catalyst on reaction rate. **Chemical Equilibrium:** Reversible reaction. Equilibrium constant. Le Chatelier's Principle. **Acid-Base:** Definition. Strong and weak acids. Strong and weak bases. pH and pOH. **Electrochemistry:** Redox reaction, electrochemical cell, Nernst equation and Faraday's Law. **Organic Chemistry:** Hydrocarbon, alkanes, alkenes, alkynes and their reactions. Functional groups. **Chemical Experiments:** Experiments on selected topics.

#### REFERENCES :

1. Hatijah Basri dan rakan-rakan (2005) *Modul pengajaran dan pembelajaran Kimia. (Module)*
2. Raymond Chang (2007) *Chemistry* 9<sup>th</sup>. Edition, McGraw-Hill.
3. Martin S.Silberberg (2003) *Chemistry. The Molecular Nature of Matter and Change, 3<sup>rd</sup> Edition.* WCB McGraw-Hill.
4. Moore, Stanitski and Jurs.(2002) *Chemistry The Molecular Science*, Harcourt College Publishers
5. Ralph A. Burns. (1999) *Fundamental of Chemistry*, 6<sup>th</sup>Edition. Prentice Hall.
6. John W.Hill and Ralph H.Petrucci. (1996) *General Chemistry*. Prentice Hall.
7. John McCurry dan Robert C.Fay.(2001) *General Chemistry*. Prentice Hall

#### DDB 1013 TEXTILE TECHNOLOGY PRACTICE I

#### SYNOPSIS :

Basic introduction to mechanical and manufacturing engineering. Skill on hand tool and measurement devices.

#### REFERENCES :

1. Dave Smith, "*Welding: Skill and Technology*", 1984, McGraw Hill
2. Richard R.Kibbe, John E. Neely, Roland O. Meyer, Warren T. White, "*Machine Tool Practices*", 1995, 5<sup>th</sup> Ed., Prentice Hall
3. Steve F. Krar, Albert F. Check, "*Technology of Machine Tools*", 1998, 5<sup>th</sup> Ed, McGraw Hill

**DDC 1013**

**PACKAGING TECHNOLOGY PRACTICE I**

**PRE-REQUISITE SUBJECTS:** None

**SYNOPSIS:**

Basics of Workshop Safety, Fabrication, Welding, Conventional lathe, Conventional mill.

**REFERENCES:**

1. Dave Smith, "*Welding: Skill and Technology*", 1984, McGraw Hill.
2. Richard R. Kibbe, John E. Neely, Roland O. Meyer, Warren T. White: "*Machine Tool Practices*", 1995, 5<sup>th</sup> Ed., Prentice Hall.
3. Steve F. Krar, Albert F. Check, "*Technology of Machine Tools*", 1998, 5<sup>th</sup> Ed, McGraw Hill.

**DDD 1013**

**MANUFACTURING TECHNOLOGY PRACTICE I**

**SYNOPSIS :**

Workshop Safety and Health, Fitting , Welding, Conventonal Lathe, Conventional Milling.

**REFERENCES :**

1. Dave Smith, "Welding: Skill and Technology", 1984, McGraw Hill
2. Richard R. Kibbe, John E. Neely, Roland O. Meyer, Warren T. White, : "*Machine Tool Practices*", 1995, 5<sup>th</sup> Ed., Prentice Hall
3. Steve F. Krar, Albert F. Check, "Technology of Machine Tools", 1998, 5<sup>th</sup> Ed, McGraw Hill

**DDE 1013**

**AUTOMOTIVE TECHNOLOGY PRACTICE I**

**PRE REQUISITE :** None

**SYNOPSIS:**

This course will introduce students to basic workshop skills such as sawing, welding, milling, and grinding, together with a discussion of safety and appropriate conduct in the workplace. Topics in this course include: Introduction to the operation of various hand tools and machining equipment, interpretation of engineering drawings, the fundamentals of welding, the principles of milling machine

operation, and the basics of grinding. Students will also learn associated workshop expertise like proper tool and tool bit selection, accurate measurement techniques, basics of threading, and gear forming. At the end of each section of the course, students will undertake simple projects that require them to incorporate and apply their previously acquired knowledge.

**REFERENCES:**

1. Dave Smith (1984) *Welding: Skill and Technology*, McGraw Hill
2. Richard R. Kibbe, John E. Neely, Roland O. Meyer, Warren T. White (1995) *Machine Tool Practices, 5<sup>th</sup> Edition*, Prentice Hall
3. Steve F Krar, Albert F. Check (1998) *Technology of Machine Tools, 5<sup>th</sup> Edition*, McGraw Hill
4. Stone, R. (1993) *Introduction to Internal Combustion Engines*, SAE International

**DDF 1013**

**PLANT TECHNOLOGY PRACTICE I**

**PRE REQUISITE : -**

**SYNOPSIS:**

Basic laboratory safety, Fitting, Welding, Conventional lathe, Conventional milling

**REFERENCES:**

1. Dave Smith, "*Welding: Skill and Technology*", 1984, McGraw Hill.
2. Richard R. Kibbe, John E. Neely, Roland O. Meyer, Warren T. White, "*Machine Tool Practices*", 1995, 5th Ed., Prentice Hall.
3. Steve F. Krar, Albert F. Check, "*Technology of Machine Tools*", 1998, 5th Ed, McGraw Hill.

**UMB 1011**

**ENGLISH FOR ACADEMIC PURPOSES**

**SYNOPSIS :**

English for Academic Purposes focuses on fulfilling students' academic requirements such as the acquisition of reading, writing, speaking and listening skills in English. The course also provides opportunities for students to acquire note taking and study skills. Students will be reinforced on aspects of English language oral and

written skills that are most relevant to them in their academic work. By the end of the course, students should be able to use English in a wide range of academic activities.

**REFERENCES:**

1. n.a (2004). *Koleksi Kertas Soalan MUET Oktober 2003*. Kuala Lumpur : Pearson Malaysia.
2. Ng. K. S. et al. (2000). *Study Skills for the Malaysian University English Test*. Kuala Lumpur : Federal Publication.
3. Pfeiffer, W.S. (2000) *Technical Writing: A Practical Approach*. New Jersey. Prentice Hall.
4. Teoh, S. A. & Zainab Mohd. Noor (2000). *Test-Taking Strategies for MUET*. Kuala Lumpur : Penerbit Fajar Bakti.
5. Walker, E. (2004) *Grammar Practice*. Kuala Lumpur. Pearson Education Malaysia. Zuraidah Mohd. Don et al. (2000). *Excel in MUET (2<sup>nd</sup> edition)*. Kuala Lumpur : Penerbit Fajar Bakti.

**YEAR 1  
SEMESTER II**

**UMA 1132                      ISLAMIC STUDIES**

**SYNOPSIS :**

This course explains about Islamic concepts which cover aqidah, syariah and akhlak. The scope of the discussion involves the Islamic principles, iman's principles and Ihsan. Focus will also be given on the basic of Islam that emphasizes on the concept of tauhid, ibadah and akhlak. This course also clarifies about the foundation of Islam (*maqasid al syariah*), current issues and the interrelation with akhlak.

**REFERENCES :**

1. Abdul Rahman I.Do, (1995), *Undang-undang Syariah, terjemahan*, Rohani Abdul Rahim, Kuala Lumpur m: Dewan Bahasa dan Pustaka
2. Harun Din, (Dr.), (2001), *Manusia dan Islam*, Kuala Lumpur, Dewan Bahasa dan Pustaka
3. Mohd. Sulaiman Haji Yasin, (1988), *Pengantar Aqidah*, Kuala Lumpur : Dewan Bahasa dan Pustaka.
4. Mustafa Hj. Daun, (1996), *Tamadun Islam*, Kuala Lumpur : Utusan Publications dan Distribution
5. Wahbah al-Zuhaily, (Dr.), (1984), *Fiqh al-Islami wa Adillatuhu*, Damsyik : Dar al-Fikr
6. Yusuf al-Qardawi, (1993), *Ibadah Dalam Islam*, Kuala Lumpur : Pustaka Suhaba

**UMA 1142                      MORAL STUDIES**

**SYNOPSIS :**

This subject explores the moral concepts, some aspects related to the morality and its importance in our daily lives, some western moral theories, moral values in great religions of the world, morality and ethics in professional careers and contemporary moral issues.

**REFERENCES :**

1. Eow Boon Hin. 2002. Moral Education. Longman.
2. Ahmad Khamis. 1999. Etika Untuk Institusi Pengajian Tinggi. Kuala Lumpur. Kumpulan Budiman.

3. Mohd Nasir Omar. 1986. Falsafah Etika; Perbandingan Islam dan Barat. Kuala Lumpur. JPM.
4. Hussain Othman. 2009. Wacana Asasi Agama dan Sains, B. Pahat. Penerbit UTHM.
5. Hussain Othman, S.M. Dawilah Al-Edrus, Berhannudin M. Salleh, Abdullah Sulaiman, 2009. PBL Untuk Pembangunan Komuniti Lestari, Batu Pahat, Penerbit UTHM.

## **UMB 1122                      TECHNICAL COMMUNICATION II**

### **SYNOPSIS :**

This course emphasises on task- based learning approach and focuses on developing students' delivery of speech in oral interactions and presentations. Importance is given on mastery of self-directed learning, team-work, research, oral presentations, reasoning and creativity. This course also enables students to acquire knowledge and skills necessary for conducting and participating in meetings, including writing of meeting documents. Students will also be exposed to the techniques of writing job application letters, resumes and conducting job interviews.

### **REFERENCES :**

1. Finkelstein, J. (2008). *Pocket Book of technical writing*. 3<sup>rd</sup> ed. Singapore: McGraw Hill.
2. Kolin, P. C. (2006). *Successful writing at work*. Concise ed. USA: Houghton Mufflin Company.
3. Salbiah Seliman et. al. (2004). *English Communication for learners in engineering*. Malaysia: Prentice Hall.
4. Lakshmy Anantha Krishnan et. al. (2003). *Engineering your report: From start to finish*. Singapore: Prentice Hall.
5. Gerson, S. J. & Gerson, S. M. (2003). *Technical writing: Process and product*. 3<sup>rd</sup>ed. New Jersey: Prentice Hall.

## **UM\* 1312                      FOREIGN LANGUAGE**

- **UMM 1312                      MANDARIN**

### **SYNOPSIS :**

This course is offered to students focusing on the learning of the basic of mandarin. Students are exposed to the skills of listening, reading, speaking and writing with basic vocabulary, grammar and

structure. Students are also provided with a lot of opportunities to practice their communication and writing skills.

**REFERENCES :**

1. Liang An Xiang. 2002. EPH Publishing (M) Sdn. Bhd. K.L.
2. Shi Yun. 2002. EPH Publishing (M) Sdn. Bhd. K.L.
3. Claudia Ross & Jing-heng Sheng Ma. 2006. Routledge. London.
4. Dr.Lim Choon Bee. 2005. Universiti Putra Malaysia Press. Serdang.
5. Hui Jin Chang. 2002. United Publishing House(M) Sdn.Bhd. K.L.
6. Claudia Ross. 2002 .Press of Ohio. USA.
7. Duan Duan Li & Yanping Xie. 2002. Press of Ohio. USA.

●                    **UMG 1312                    GERMAN**

**SYNOPSIS :**

This course is designed for students to learn the basic of German language. Students are exposed to the skills of listening, reading, speaking, and writing with basic vocabulary, grammar and structure. Students are also exposed to the real daily situations which will help them to communicate using German language.

**REFERENCES :**

1. Nur Zakiah binti Amir Hamzah, Guten Tag der deutschen sprache, Pejabat Penerbit UTHM
2. Angela Wilkes. 2006. *GERMAN FOR BEGINNERS*, London: Usborne Publishing Ltd.
3. Hartmurt Aufderstrasse. 1998. *Themen Neu 1*, Lehrwerk fuer Deutsch als Fremdsprache, Textbook. Muenchen: Max Hueber Verlag.
4. Dr. Albert H. Small. 1991. *German â la Cartoon*. German Grammar through Cartoons. Passports Books

●                    **UMJ 1312                    JAPANESE**

**SYNOPSIS :**

This course is designed for students to learn basic Japanese language such as speaking, listening, reading, and writing. Students will be exposed to the real daily conversations which will enable them to communicate in basic Japanese language.

## REFERENCES :

1. *Kodansya`s Furigana Japanese Dictionary(2005)*
2. Minna no Nihongo Listening ( 2006 ) Second Published :3A Corporation Tokyo
3. Minna no Nihongo Jap-English ( 2006 ) Second Published :3A Corporation Tokyo
4. Japanese Conversation for Beginners (2006) Bonjinsha,Tokyo Japan
5. Japanese Language Center for International Students,Tokyo University of foreign Studies
6. Modul Pengajaran Bahasa Jepun Tahap 1 (2008) Penerbit UTHM
7. The AOTS Nihongo Dictionary for Practical Use (2005) 3A Corporation,Japan
8. Informative Japanese Dictionary (2005) Shinchousha Corporation,Japan

●                    **UMR 1312                    ARABIC**

## SYNOPSIS :

This course is designed for students to learn the basic Arabic. Students are exposed to the skills of listening, reading, speaking, and writing with basic vocabulary, grammar and structure. Students are also exposed to the real daily situations which will help them to communicate using Arabic language.

## REFERENCES :

1. Mohd Hisyam Abdul Rahim; Ahmad Sharifuddin Mustapha; Mohd Zain Mubarak. 2008. *Bahasa Arab UMR 1312*. Batu Pahat: Penerbit UTHM.
2. Mohd Hisyam bin Abdul Rahim. 2005. *Senang Berbahasa Arab*. Batu Pahat: Penerbit KUiTTHO.
3. Ab. Halim Mohammed; Rabiyah Hajimaming; Wan Muhammad Wan Sulong. 2007. *Bahasa Arab Permulaan*. Serdang: Penerbit UPM.
4. Mohd Khairudin Khudri. 2006. *Akar Umbi Pembelajaran Bahasa Arab*. Kajang: One Touch Creative.
5. Sini, Mahmud Ismail; Abd Aziz, Nasif Mustapha; Husayn, Mukhtar. T.th. *al`Arabiyyah Lil Nashiin, Kitab al-Tilmiz*. al-Mamlakah al-Saudiah: Idarah al-Kutub al-Madrasiyah, Wizarah al-Taalim.
6. Ahmad Hassan. 1995. *Pelajaran Bahasa Arab Untuk Orang Bukan Arab*. Kota Bharu: Pustaka Aman Press.



7. Hashim Hanafiah. 1981. *Al- Lughah al-Arabiyyah*. Kuala Lumpur: Percetakan Watan.

●                    **UMP 1312                    SPANISH**

**SYNOPSIS :**

This course is designed for students to learn the basic Spanish language. Students are exposed to the skills of listening, reading, speaking, and writing with basic vocabulary, grammar and structure. Students are also exposed to the real daily situations which will help them to communicate using Spanish language.

**REFERENCES :**

1. Nurul Sabrina Zan: *Hola! Hablo español* First Edition Batu Pahat: Penerbit UTHM.
2. Joy Renjilian - Burgay, Ana Beatriz Chiquito y Susan M. Mraz: *Caminos*
3. Salina Husain : *Vamos a aprender español lengua extranjera*
4. Gail Stein : *The Complete IDIOT'S GUIDE to Learning Spanish on Your Own* Second Edition.
5. Irwin Stern : *Ultimate SPANISH* revised and update.
6. Julianne Dueber : *Spanish Vocabulary by Barron's Educational Series, Inc.*
7. Oxford University Press 1997,2000 Second Edition 2000- *The Pocket Oxford Spanish Dictionary*
8. Collins Dictionary: *Español>Inglés, English>Spanish* - New Edition

●                    **UMF 1312                    FRENCH**

**SYNOPSIS :**

This course is offered to students focusing on the learning of the basic of French. Students are exposed to the skills of listening, reading, speaking and writing with basic vocabulary, grammar and structure. Students are also provided with a lot of opportunities to practice their communication and writing skills.

**REFERENCES :**

1. Girardet, Jacky et Cridlig, Jean-Marie, 1996. *Méthod de français: PANORAMA 1*. Paris: CLE International.

2. Hatier, 1995. Le Nouveau Bescherelle Complete Guide 12 000 French Verbs. Paris: LIBRAIRIE HATIER.
3. Kaneman-Pougatch, Massia et al, (1997). Méthod de français: Café Crème 1. Paris: HACHETTE F.L.E.
4. Grégoir, Maïa et al, (1995). Grammaire Progressive du Français avec 500 Exercices. Paris: CLE International.
5. Miquel, Claire Leroy et al, (1995). Vocabulaire Progressive du Français avec 250 exercices. Paris: CLE International.
6. Capelle, Guy et Gidon, Noëlle, 1995. Méthod de français: Le Nouvel Espaces 1. Paris: HACHETTE F.L.E..
7. Hatier. 2002. Le Nouveau Bescherelle 12,000 French Verbs. English Edition. Paris: Librairie Hatier.
8. Das, Theresa & Yam-Ramanantsoa, Hanta. 1992. Bienvenue Chez Nous. Kuala Lumpur: L'Ambassad de France et DBP.
9. DBP, USM & Kedutaan Besar Perancis, 1996. Kamus Perancis Melayu Dewan. Kuala Lumpur: DBP
10. French Dictionary 1999. The New Collins Robert 5<sup>th</sup> Edition. Paris: Harper Collins Publishers.

## **DSM 1923**

## **MATHEMATICS II**

**PRE REQUISITE : DSM 1913 (MATHEMATICS I)**

### **SYNOPSIS :**

**Limit:** Definition, one-sided limit, limit at infinity. Limit and continuity of functions. **Differentiation:** First principle, differentiation rules, higher order differentiation, the chain rule, differentiation of functions : logarithmic, exponential, implicit, parametric, trigonometric, and hyperbolic. **Application of Differentiation:** Small increment, rates of change, applied maximum and minimum problems, analysis of functions, curve sketching. *L'Hôpital's* Rules :  $(0/0, \infty/\infty, 0 \cdot \infty, \infty^0, 1^\infty, \infty - \infty)$ . **Integration:** As anti derivatives, integration of standard function. Definite integral. Integration techniques: substitution, partial fraction and by part. **Numerical Integration:** Trapezium, Simpson 1/3. **Application of Integration:** Area of a region, volume of revolution, curve length, surface area of revolution. **Improper Integral.**

## REFERENCES

1. Abd. Wahid Md. Raji, Hamisan Rahmat, Ismail Kamis, Mohd Nor Mohamad, Ong, C.T. (2003) *Calculus*
2. Anton, H., Bivens, I., Davis, S. (2005) *Calculus*. 8<sup>th</sup> Ed. USA: John Wiley & Sons, Inc.
3. Berkey, D.D & Blanchard. Paul (1992) *Calculus*. 3<sup>rd</sup> Ed. New York : Saunders College Publishing
4. Thomas, G. B., Finney, R. L. (1996) *Calculus and Analytic Geometry*. 9<sup>th</sup> Ed. USA: Addison- Wesley Publishing Company.
5. Stroud, K. A., Booth, D.J. (2007) *Engineering Mathematics*. 6<sup>th</sup> Ed. US: Palgrave Macmillan.
6. Yusof Yaacob, Maslan Osman (2001) *MATHEMATICS Kejuruteraan*. Skudai : UTM

## DSF 1973

## PHYSICS II

### SYNOPSIS :

**Elasticity of Material:** Stress and strain, Hooke's Law, Young's Modulus, Stress-strain diagram, shear modulus, bulk modulus, Poisson ratio. **Hidrostatic:** Pressure, density, Pascal principle, Archimedes principle, bouyancy. **Heat and Temperature:** Definitions of heat and temperature, thermal equilibrium, temperature scales, Heat: Heat capacity and specific heat, latent heat of fusion, latent heat of vaporization, calorimetry principles. Heat Transfer: Conduction and convection. **Thermal Properties of Matter:** Linear expansion, area expansion and volume expansion. Liquid Expansion: Apparent and absolute expansion. **Mechanical Wave:** Wave Definition, characteristics and types of mechanical wave, general equation of progressive wave, superposition principle, standing wave, stretched string, air column in open and closed pipes, wave velocity in mediums. **Sound Wave:** Sound intensity, sound level, Doppler's effect. **Electromagnetic Wave:** Lights as an electromagnetic wave, intensity and density of energy. Lighting: Candela, lumens. **Interference:** Conditions for interference, conditions for constructive and destructive interference, Young's double-slit interference. **Diffraction:** Fraunhofer diffraction (single slit). **Polarization:** Polarization method and Malus's Law. **Geometrical Optics:** Reflection of Light: Reflection Law, formation of image by plane mirror. **Refraction of Light:** Snell's Law, characteristics of spherical lens (Concave and Convex), formation of image by plane and spherical surface, magnification of image by

spherical lens. **Physic Laboratory:** Related to the topics in DSF 1973.

## REFERENCES

1. Giambattista, A., Richardson, B. M., Richardson, R. C. (2007) *College Physics* 2<sup>nd</sup> Ed. New York: Mc Graw Hill.
2. Serway, R. A., Faughn, J. S., Moses, C. J. (2003) *College Physics*. 6<sup>th</sup> Ed. USA: Pacific Grove, CA: Thomson Learning.
3. Bueche, F. J., Hecht, E., Hademenos, G. J. (2000) *College Physics: Based on Schaum's Outline of College Physics*. New York: McGraw-Hill.
4. Urone, P. P. (2001) *College Physics*. 2<sup>nd</sup> Ed. USA: Pacific Grove, CA: Brooks/Cole.

## DDA 1013                      STATICS

### SYNOPSIS :

Introduction to Static, Static of Particles, Static of Rigid Bodies, Centroids and Centre of Gravity, Analysis of Structures and Friction.

### REFERENCES :

1. Hibbeler R. C., 2001. "*Engineering Mechanics - Statics*" S. I. Edition, Prentice Hall
2. Bear F. P. and Johnson E. R., 1997. "*Vector Mechanics for Engineers - Statics*", 2<sup>nd</sup> S. I. Metric Edition, Mc Graw Hill
3. Meriam J. L. and Kraige L.G., 1997. "*Engineering Mechanics Vol. 2 - Statics*", Fourth Edition, John Wiley & Sons, Inc
4. Mohd Imran Ghazali dan Mohd Shukor Abu Hassan, 2002. "*Mekanik ENGINEERING– Statik*", Jilid 1 & 2, Penerbit UTM

## DDB 1023    TEXTILE TECHNOLOGY PRACTICE II

### SYNOPSIS:

Safety in Laboratory, Introduction to Spinning Machine, Operation of Spinning Machine, Maintenance and Troubleshoot of Spinning Machine, Introduction of Weaving Machine, Operation of Weaving Machine, Maintenance and Troubleshoot of Weaving Machine

## REFERENCES:

1. Klein, W. ( 2000 ). A Practical Guide To The Blowroom And Carding, 2<sup>nd</sup> Ed., The Textile Institute.
2. Klein, W. ( 2000 ). A Practical Guide To The Ring Spinning, 2<sup>nd</sup> Ed., The Textile Institute.
3. Lord, P. ( 2000 ). Yarn Production : Science, Technology and Economics, The Textile Institute.

## DDC 1023

## PACKAGING TECHNOLOGY PRACTICE II

### SYNOPSIS:

Introduction to pneumatic and hydraulic, characteristics and specifications of pneumatic component, easy pneumatic circuit (parallel and series), programmable logic controller and pneumatic components changing, hydraulic and electrical towards the operational of package system.

### REFERENCES:

1. Hanlon, J., 1992, *"Handbook of Packaging Engineering"*, Technomic Publishing.
2. C. Glenn Davis.,1995, *"Introduction to Packaging Machinery"*, Packaging Machinery Manufacturers Association. U. S. A.
3. Brody, A.L and Marsh.,1997, *"The Wiley Encyclopedia of Packaging Technology"*, J. Wiley & Sons, Inc.
4. C. Glenn Davis., 1990 *"Packaging Converting Machinery Components"*,4<sup>th</sup> Edition, Packaging Machinery Manufacturers Institute, U.S.A.

## DDD 1023

## MANUFACTURING TECHNOLOGY PRACTICES II

### SYNOPSIS :

Foundry workshop safety, wood, wax pattern, moist sand mould, sand attributes, plaster mould, wax mould casting, lost spume casting, industrial automation, pneumatic control system, electro-pneumatic and hydraulic machine system.

### REFERENCES :

1. S Kalpakjian dan E.D Addison,,: *"Manufacturing Processes for Engineering Materials"*, 1987, 2<sup>nd</sup>, John Wiley and Sons

2. P.L Jain, “*Foundry Patterns: Design and Manufacture, National Institute of foundry and Forge Technology*”, 1989, McGraw-hill
3. Mchael J.Riches, “*Hydraulic Power*”, (Penterjemahan: Wan Mohd Norsani Wan Nik), 1995

**DDE 1023                      AUTOMOTIVE TECHNOLOGY PRACTICE II**

**PRE REQUISITE :** None

**SYNOPSIS:**

This course will introduce students to maintenance of major vehicle components. Topics in this course include: carburettor systems, diesel fuel systems, vehicle electrical systems, air-conditioning systems, brake systems, steering systems and suspension systems. Students will also acquire associated knowledge relevant to the subject, such as air-fuel ratio adjustments, basic theories regarding injector pumps and distributors, electrical circuit wiring, and steering alignment settings.

**REFERENCES:**

1. Heywood, J. B., (1988) *Internal Combustion Engine Fundamentals*, McGraw Hill Book Co. Singapore
2. Ferguson, C. R., Kirkpatrick, A. T., (2001) *Internal Combustion Engine: Applied Thermo Science*, John Wiley & Sons Inc. USA
3. Knowles, D., Erjavec, J., (1998) *Automotive Engine Performance, 2<sup>nd</sup> Edition*, Delmar Publisher
4. Stone, R. (1993) *Introduction to Internal Combustion Engines*, SAE International

**DDF 1023                      PLANT TECHNOLOGY PRACTICE II**

**PRE REQUISITE : -**

**SYNOPSIS:**

Air compressors and pumps are widely used for personal and industrial needs. The types of air compressor used are depending on the applications, similar with internal combustion engines. The purposes of this subject are to give introduction, understanding, and working principle of air compressor and pump and also to learn the functions of each component. Students will be given basic skills on maintenances and performing tests on these equipments.

**REFERENCES:**

1. Robert Chatenever , *Air conditioning and refrigeration for the professional* , Prentice Hall , 1988
2. Nicholas P. Cheremisinoff , *Compressor and Pump* , Prentice Hall , 1992
3. Rosli Husin *Enjin Kereta* Dewan Bahasa dan Pustaka , 1994
4. Automobile Association fanum house *Money saving motoring* , 1978

**YEAR 2**



**YEAR 2  
SEMESTER I**

**UMA 3032 AKIDAH KETUHANAN DAN SAINS**

**SYNOPSIS :**

Perbincangan dalam kursus ini tertumpu kepada dua perkara asas iaitu konsep pegangan akidah keagamaan dan juga pandangan tentang sains. Konklusi daripada daripada kursus ini ialah untuk melihat kewujudan hubungan antara kedua perkara ini serta bentuk-bentuk hubungan yang wujud antara keduanya. Hasilnya ialah pembentukan satu model pemikiran ke arah mengharmonikan sains dengan dasar kepercayaan agama. Kandungan kursus ini terdiri daripada; Manusia dan agama; teori asal usul agama, peringkat perkembangan aqidah daripada monotheism kepada polytheism serta faktor-faktor penyelewengan aqidah monotheism mutlak. Konsep ketuhanan dalam berbagai agama. Sains dan nilai serta kebangkitan pemikiran sains barat dan sumbangan pemikiran sains Islam terhadapnya.

**REFERENCES :**

1. Aminuddin Ruska Al-Dawamy (et al) (1998), *Aqidah Ketuhanan dan Sains*. Skudai. Pusat Pengajian Islam dan Pembangunan Sosial, Universiti Teknologi Malaysia
2. Hussain Othman (2001), *Iman dan Sains: Satu Pengenalan*, Pusat Pengajian Kemanusiaan dan Komunikasi, KUiTTTHO
3. Haron Din. (et al, 3 jilid) (1994). *Manusia dan Islam*. Kuala Lumpur: Dewan Bahasa dan Pustaka
4. Titus, Harold H dan Marilyn S. Smith. *Living Issues In Philosophy* (1974). New York. D. Van Nostrand Company

**DDA 2012 SUPERVISION SKILL**

**SYNOPSIS:**

To build a supervision skills with leadership in organization based on engineering and technology, in part one covered topic foundations of supervision, making decisions, communication, ethics and organization's politics and managing time, part two give emphasis for planning and organizing skills, part three also emphasis in the process recruitment of staff, development of staff, performance evaluation, job right and workers' associaton, part four focused on

human relations skills, part five role of controlling skills in helping supervision process.

### **REFERENCES:**

1. Rue, W.L. and Byars L.L. (2001). *"Supervision: Key Link to Productivity"*. 7<sup>th</sup> edition. Irwin, McGraw Hill.
2. Kouzes, J.M. and Posner, B.Z.(1996). *"Leadership Challenge: How To Keep Getting Extraordinary Things Done In Organisations"*. 2<sup>nd</sup> edition. John Wiley & Sons Ltd.
3. Schein E.H. (1999). *"Organisational Culture and Leadership"*. 2<sup>nd</sup> edition. John Wiley & Sons Ltd.
4. Manz C.C. and Sims H.P.,JR. (2001). *"The New Superleadership"*. Berrett Koehler Publishers.

### **DDA 3052**

### **INDUSTRIAL ENGINEERING**

#### **SYNOPSIS:**

This subject covers the Introduction of Industrial Engineering, Facilities Planning, Basic Concepts of Statistics, Method Study, Work Measurement, Ergonomics, Production Planning and Control, Quality Control, Material Resources Planning (MRP), Just in Time (JIT), Supply Chain Management.

#### **REFERENCES:**

1. Heizer, J. and Render, B., 2006, "Principles of Operations Management", 8<sup>th</sup> Edition, Prentice Hall.
2. Krajewski, L.J., 2002, "Operations Management: Strategy and Analysis", 6<sup>th</sup> Edition, Prentice Hall.
3. Stevenson, W.J., 2007, "Operations Management", 9<sup>th</sup> Edition, McGraw Hill.
4. Wayne C. Turner, Joe H. Mize, Kenneth E. Case and John W. Nazemeth, 1993, "Introduction to Industrial and Systems Engineering", 3<sup>rd</sup> ed., Prentice Hall.

### **DDA 2022**

### **ENGINEERING DRAWING**

#### **SYNOPSIS :**

*Geometry drawing, Geometry, Dimensioning, Tolerance and limits, Orthographic, Isometric, Cross section drawing.*

## REFERENCES :

1. **Mohd. Fadzil Daud, Khairul Anuar Hanafiah, (2000)**, "*Panduan Asas Lukisan Kejuruteraan*", Universiti Teknologi Malaysia.
2. **A.W. Boundy, (2002)**, "*Engineering Drawing - Six Edition*", Mc.Graw Hill.
3. **Gieseckle, Mitchel. Hill (2000)**, "*Engineering Graphics*", Seventh Edition, Prentice Hall, Prentice Hall.
4. **M. B. Shah, B. C. Rana, (2005)**, "*Engineering Drawing*", Pearson Education.

## DDA 2033 THERMODYNAMICS

**PRE REQUISITE :** Mathematics II and Physics II

### SYNOPSIS :

Definition and basic concepts. Properties of compressible pure substances. Heat and Work. The First Law of Thermodynamics. The Second Law of Thermodynamics. Entropy, Thermodynamics Cycles.

### REFERENCES :

1. Howel, J. R. dan Buckins, R. O., (1993), "*Fundamental of Engineering Thermodynamics*", McGraw Hill.
2. Spalding, D. R dan Cole, E. H., (1978), "*Engineering Thermodynamics*", 3<sup>rd</sup> Edition, Edward Arnold.
3. Rogers, G. F. C. dan Meyhew, Y. R., (1993), "*Engineering Thermodynamics: Work and Heat Transfer*", Longman.
4. Cengel, Y. A. dan Boles, M. A., (1994), "*Thermodynamics: An Engineering Approach*", 2<sup>nd</sup> Edition, McGraw Hill.

## DDA 2711 ENGINEERING LABORATORY I

### SYNOPSIS:

*Static:*

*Force Equilibrium, Principle of Moment, Rigid Body Equilibrium, Centre of Gravity, Friction on Plane.*

*Thermodynamic:*

*Marcet Boiler, Petrol Engine Performance Test, Air Conditioning and Cooling Unit.*

*Materials Science:*

*Impact Test, Creep Test, Modulus of Rupture (MOR) Test, Polymer Tensile Test, Hardness Test, Heat Treatment Test.*

**REFERENCES:**

1. Boles M. A. and Cengel Y.A., 2006, "*Thermodynamics: An Engineering Approach*", 5<sup>th</sup> edition, Mc Graw Hill.
2. Hibbeler R.C., 2005, "*Mechanics of Materials*", SI Second Edition, Prentice Hall International.
3. Callister, W.D. Jr, 2007, "*Materials Science and Engineering: An Introduction*", 7<sup>th</sup> Edition, John Wiley.
4. Shackelford, J.F., 2005, "*Introduction to Materials Science for Engineers*", 5<sup>th</sup> 4. Edition, Prentice Hall.

**DDA 2043**

**MATERIALS TECHNOLOGY**

**SYNOPSIS:**

*Introduction, Characteristic and Imperfection of Materials, Phase Diagram and Heat Treatment, Design Process, Materials Selection Charts, Selection of Ferrous Materials, Selection of Non-Ferrous Materials, Environmental Effects.*

**REFERENCES:**

1. Callister, W.D. Jr, 2007, "*Materials Science and Engineering: An Introduction*", 7<sup>th</sup> Edition, John Wiley.
2. Smith, W.F., 2004, "*Principles of Materials Science and Engineering*", 3<sup>rd</sup> Edition, McGrawHill.
3. Ashby M.F., 2000, "*Materials Selection in Engineering Design*", 2<sup>th</sup> Edition, Butterworth-Heinemann.
4. Manganon P.L., 1999, "*The Principles of Materials Science for Engineering Design*", Prentice Hall.

## **DDB 2013      TEXTILE TECHNOLOGY PRACTICE III**

### **SYNOPSIS:**

Introduction to Knitting Machine, Operation of Knitting Machine, Maintenance and Troubleshoot of Knitting Machine, Introduction to Dyeing Process and Machine, Operation of Dyeing Machine, Maintenance and Troubleshoot of Dyeing Machine

### **REFERENCES:**

1. Ingamells, W. ( 1993 ). Colour For Textiles, A User's Handbook. Society of Dryers & Colourists.
2. Brady, P.R ( 1998 ). Finishing And Wool Fabric Properties – A Guide To The Theory And Practice Of Finishing Woven Wool Fabrics , The Textile Institute.
3. Brown P. "Knitting Principles." North Carolina. Textiles Extension and Continuing Education School of Textiles.

## **DDC 2013                      PACKAGING TECHNOLOGY PRACTICE III**

### **SYNOPSIS:**

Introduction to packaging material testing, types of testing, factor determination of testing types, standard testing, factor of parameters chosen on package testing.

### **REFERENCES:**

1. Richard K. Brandenburg & Julian June-Ling Lee.,1985, "*Fundamentals of packaging Dynamics*", School of Packaging, Michigan State University, MTS System Corporation.
2. Paine, F. A., 1991, "The Packaging User's Handbook", Backie and Son Ltd.
3. Hanlon, J.,1992, "Handbook of Packaging Engineering", Technomic Publishing.
4. Brody, A.L and Marsh.,1997, "The Wiley Encyclopedia of Packaging Technology", J. Wiley & Sons, Inc.

## **DDD 2013      MANUFACTURING TECHNOLOGY PRACTICE III**

### **SYNOPSIS :**

Basics of metal cutting, cutting tools materials and cutting fluids, CNC Turning, CNC Milling, CAD/CAM software application in manufacturing, editing and transferring machining programme.

### **REFERENCES :**

1. Richard R. Kibbe, John E. Neely, Roland O. Meyer, Warren T. White, *"Machine Tool Practices"*, 2006, 8<sup>th</sup> Ed., Prentice Hall
2. Robert Quesada, *"Computer Numerical Control : Machining And Turning Centers"*, 2005, 1<sup>st</sup> Ed., Prentice Hall
3. Steve F. Krar Albert F. Check, *"Technology of Machine Tools"*, 1998, 5<sup>th</sup> Ed, McGraw Hill
4. *"Mastercam X3 /Design Tutorial"*, 2008 CNC Software, Inc

## **DDE 2013      AUTOMOTIVE TECHNOLOGY PRACTICE III**

**PRE REQUISITE :** None

### **SYNOPSIS:**

This course will introduce students to minor and major maintenance work on assorted vehicle components. Topics in this course include: Engine theory, safety, operation systems, engine diagnosis, engine material, gaskets, specialized hand tools, radiators, coolant pumps, combustion cycles, inlet and exhaust orifice, cylinder head, crank shafts, drive shafts, valves, and also engine disassembly and reassembly. Students will additionally perform a major engine overhaul, and testing of the repaired vehicle components. They will also acquire additional knowledge in relevant areas such as ignition timing, engine cooling, and lubrication of moving parts.

### **REFERENCES:**

1. Heywood, J. B., (1988) *Internal Combustion Engine Fundamentals*, McGraw Hill Book Co. Singapore
2. Ferguson, C. R., Kirkpatrick, A. T., (2001) *Internal Combustion Engine: Applied Thermo Science*, John Wiley & Sons Inc. USA
3. Knowles, D., Erjavec, J., (1998) *Automotive Engine Performance, 2<sup>nd</sup> Edition*, Delmar Publisher
4. Stone, R. (1993) *Introduction to Internal Combustion Engines*, SAE International

**DDF 2013**

**PLANT TECHNOLOGY PRACTICE III**

**SYNOPSIS:**

Most of electrical power generator stations used steam power plant to generate electricity. In heavy industry also use steam power plant in their operations. The main components in power plant are Boiler, Superheater, Turbine, Condenser and Cooling Tower. The scopes for this subject are introduction and understanding on overall operation of power plant system.

**REFERENCES:**

1. Kohan & Spring , ‘ *Boiler Operator’s Guide* ’ , McGraw Hill , 1991
2. David Landsley , ‘ *Boiler Control System* ’ , McGraw Hill , 1991
3. Antonio Naviglio , ‘ *Hydraulic Design of Components for Steam Generation Plant* ’ , CRC Press , 1991

**YEAR 2  
SEMESTER II**

**DSM 2913                      MATHEMATICS III**

**PRE REQUISITE            :            MATHEMATICS II**

**SYNOPSIS :**

**Matrices:** Arithmetic operations, row operations, system of linear equations: inverse matrices, Gauss Jordan elimination and numerical solution : Gauss-Seidel method . **Vector:** Dot and cross product,. Line and plane equation in  $R^3$ . **Complex Number:** Definition, arithmetic operations, polar form, Euler, De Moivre theorem. **First Order Linear Differential Equation:** Separable, homogeneous, linear and exact, Application of first order differential equations. **Second Order Linear Differential Equations:** Undetermined coefficients, variation of parameters. **Laplace Transform:** Definition, characteristics : linearity, first shift, and multiply with  $t^n$ . **Inverse Laplace Transform:** Definition and characteristics. Convolution theorem. Initial and boundary value problems.

**REFERENCES :**

1. Abd Wahid Raji et.al. (2000) *MATHEMATICS Asas Jilid 11*, Jabatan MATHEMATICS, Fakulti Sains, UTM.
2. Abd. Wahid Md. Raji, Mohd Nor Mohamad (2008) *Differential Equations for Engineering Students*.
3. Anton, H., Bivens, I., Davis, S. (2005) *Calculus*. 8<sup>th</sup> Ed. USA: John Wiley & Sons, Inc.
4. Berkey, D.D & Blanchard. Paul. (1992) *Calculus* 3<sup>rd</sup> Ed. New York : Saunders College Publishing.
5. Stroud, K. A., Booth, D.J. (2007) *Engineering Mathematics*. 6<sup>th</sup> Ed. US: Palgrave Macmillan.

**DDA 2092                      MANUFACTURING TECHNOLOGY**

**SYNOPSIS :**

Introduction to manufacturing, manufacturing part geometrical distribution, aspect of materials, design and manufacturing, casting process, plastic shaping process, shaping process, material removal



process, joining process, measurement and quality confirmation. Introduction to material selection, design process, engineering material and behaviour.

### REFERENCES :

1. Kalpakjian S., Addison E.D, "*Manufacturing Processes for Engineering Material*", 1997, 2<sup>nd</sup> edition, Addison and Wesley,.
2. Amstead B.H., Phillip F. Ostwald and Myron L. Begeman., "*Manufacturing Process*", 1987, John Wiley and Son
3. Ashby MF, 2000, "*Materials Selection in Engineering Design*", 2th Ed., Butterworth-Heinemann

### DDA 2063

### DYNAMICS

### PREREQUISITE: STATICS

### SYNOPSIS:

This subject is an introduction of engineering dynamics to diploma students in mechanical engineering. The topics cover mainly in two dimensional or planar coordinate system of kinematics and kinetics of particles as well as the kinematics and kinetics of rigid bodies. Practical engineering applications found in mechanical engineering field are discussed in the form of example problems. On completion, students will be able to determine the position, velocity and acceleration of particles and rigid bodies using kinematics analytical approach, to use law of motion to relate forces and acceleration of particles and rigid bodies, to apply the principle of work and energy to solve kinetics problem on particles or rigid bodies, and to solve the kinetics problems using the principles of impulse and momentum. Since a group project is part of the assignments, students are trained to effectively communicate ideas and to present the team conclusion in a professional manner.

### REFERENCES:

1. Hibbeler R.C., 2007. "*Engineering Mechanics - Dynamics*", 11<sup>th</sup> S.I. Edition, Prentice Hall
2. Meriam J.L. and Kraige L. G., 2008. "*Engineering Mechanics - Dynamics*", 6<sup>th</sup> Edition, John Wiley.
3. Bear F.P and Johnson E.R.,2007. "*Vector Mechanics for Engineers - Dynamics*", 8<sup>th</sup> S.I. Metric Edition, Mc Graw Hill
4. Siswanto W.A, 2008. "*Principles of Engineering Dynamics – Concise Theory and Applications*", First Edition, Penerbit UTHM.

**DDA 2073**

**MECHANICS OF SOLIDS**

**PRE REQUISITE : STATICS**

**SYNOPSIS :**

Stress and Strain, Shear Force and Bending Moment, Bending Stress, Torsion, Thin Cylinder and Complex Stress.

**REFERENCES :**

1. Hibbeler, R.C., 2005. *“Mechanics of Materials”*, SI Second Edition, Prentice Hall International.
2. Gere, J.M. dan Timoshenko, S.P., 1997. *“Mekanik Bahan”*, edisi ketiga, Penerjemah : Ahmad Zafri Zainuddin, Muhammad Her Jantan, UTM.
3. Beer, F.P and Johnston, E.R., 1996. *“Mechanics of Materials”* John Wiley.
4. Modul Mekanik Pepejal 1, UTM.

**DDA 2721**

**ENGINEERING LAB PRACTICE II**

**SYNOPSIS:**

Solid Mechanics: Tensile, Torsion, Shearing Force in Beam, Bending Moment, Thin Cylinder.

Dynamic: Rectilinear Motion, Curvilinear Motion, Second Newton Law, Rotation about Fixed Axis, General Plane Motion.

**REFERENCES:**

1. Keith M. W., 2004, *“Applied Mechanics for Engineering Technology”*, 7<sup>th</sup> edition, Prentice Hall.
2. James M. dan Timoshenko, Stephen P.; Ahmad Zafri Zainudin, Muhammad Her Jantan dan Yahaya Ramli; Penerjemah, 1997, *“Mekanik Bahan”*, Edisi Kedua, UTM.
3. Beer F. and Johnston E. R., 1992, *“Mechanics of Materials”*, 2<sup>nd</sup> Edition, Mc Graw Hill.
4. Bickford W. B., 1993, *“Mechanics of Solids, Concepts and Applications”*, Mc Graw Hill.
5. Meriam J. L & Kraige L. G., 1990, *“Applied Engineering Mechanics: Dynamics”*, Prentice Hall.

## **DDB 2023      TEXTILE TECHNOLOGY PRACTICE IV**

### **SYNOPSIS:**

Introduction to the Types of Fabric Testing, Fabric Testing, Introduction to Design Drawing Software, Operation of Heat Transfer Machine, Maintenance and Troubleshoot of Heat Transfer Machine, Introduction to Tajima DG/ML Software, Operation of Computerized Embroidery Machine

### **REFERENCES:**

1. Collier B.J. and Tortora P.G. (2001). "Understanding Textiles." 6<sup>th</sup> edition. New Jersey. Prentice Hall.
2. Collier B.J. and Epps H.H. "Textile Testing and Analysis." Prentice Hall.
3. Tajima DG/ML By Pulse (2001). "User's Guide".

## **DDC 2023                      PACKAGING TECHNOLOGY PRACTICE IV**

### **SYNOPSIS:**

Types of packaging machine, rigid packaging, flexible packaging, general operational and package printing.

### **REFERENCES:**

1. Hanlon, J., 1992, "*Handbook of Packaging Engineering*", Technomic Publishing.
2. C. Glenn Davis.,1995, "*Introduction to Packaging Machinery*", Packaging Machinery Manufacturers Association. U. S. A.
3. Eldrel, E., 1993, "*Package Printing*", : Jelmar Publishing.
4. Brody, A.L and Marsh.,1997, "*The Wiley Encyclopedia of Packaging Technology*", J. Wiley & Sons, Inc.

## **DDD 2023      MANUFACTURING TECHNOLOGY PRACTICE IV**

### **SYNOPSIS :**

Programmable automated system, PLC circuit and installation system, Basic technology of industrial robotic, robot operation, EDM wire cut and EDM die sink.

### **REFERENCES :**

1. McGeough, J.A., *“Advanced Methods of Machining”*, 1988, Chapman and Hall, New York
2. FESTO : Pneumatics, Electro-pneumatics, Programmable Logic Controller
3. Mitsubishi Electric Corporation, *“Mitsubishi Industrial Robot CR Controller Instruction Manual”*, 2004, Japan

## **DDE 2023                      AUTOMOTIVE TECHNOLOGY PRACTICE IV**

### **SYNOPSIS:**

This course will introduce students to basic power delivery systems in automotive vehicles. Topics in this course include: transmissions, clutch, manual transmissions, automatic transmissions, heavy vehicle testing and LPG vehicles. Students will also perform post-maintenance vehicle testing, hydraulic system diagnostics, undercarriage inspection and maintenance, handling of heavy vehicles such as back-hoe and tractors, as well as LPG leakage detection and periodic maintenance.

### **REFERENCES:**

1. Heywood, J. B., (1988) *Internal Combustion Engine Fundamentals*, McGraw Hill Book Co. Singapore
2. Ferguson, C. R., Kirkpatrick, A. T., (2001) *Internal Combustion Engine: Applied Thermo Science*, John Wiley & Sons Inc. USA
3. Knowles, D., Erjavec, J., (1998) *Automotive Engine Performance, 2<sup>nd</sup> Edition*, Delmar Publisher
4. Stone, R. (1993) *Introduction to Internal Combustion Engines*, SAE International

**DDF 2023**

**PLANT TECHNOLOGY PRACTICE IV**

**SYNOPSIS:**

Each student must understand the concept of air conditioning system for industrial process or for comfortable working areas. Main components for air conditioning system are compressor, condenser, thermal expansion valve, evaporator, ventilation system and cooling tower. This subject focuses on safety in working area and maintenance for air conditioning system.

**REFERENCES:**

1. Whitman, Johnson, Tomczyk (2000), *Air Conditioning and Refrigeration for The Professional*, Prentice Hall
2. Tom Birch (2000), *Automotive Heating and Air Conditioning*, second edition, Prentice Hall  
Robert Chatenever , *Air conditioning and refrigeration for the professional* , Prentice Hall , 1989

**DD\* 2\*\*3**

**ELEKTIF TEKNOLOGI I (SILA RUJUK M/S..)**

**YEAR 3**

**YEAR 3  
SEMESTER I**

**DDA 3023                      CAD**

**PRE REQUISITE :** Engineering Drawing

**SYNOPSIS :**

*Introduction to computer aided design (CAD), coordinate system and using object snap, draw command, editing drawing, 2D drawing, dimensioning, 3D drawing, assembly drawing, plotting.*

**REFERENCES:**

1. **Khairul Anuar Hanafiah (2006)**, "*Lukisan ENGINEERING Berbantu Komputer – Edisi Kedua*", Universiti Teknologi Malaysia, Johor, Malaysia.
2. **Jamaluddin Mohd Taib, Khairul Anuar Hanafiah dan Mohd Fadzli Daud (2006)**, "*Rekabentuk Berbantu Komputer – Asas Pemodelan*", Universiti Teknologi Malaysia, Johor, Malaysia.
3. "*AutoCAD 2006, user guide*".
4. **Mohd Fadzli Daud and Khairul Anuar Hanafiah (2000)**, "*Panduan Asas Lukisan Kejuruteraan*", Universiti Teknologi Malaysia, Johor, Malaysia.

**DSM 2932                      ENGINEERING STATISTICS**

**PRE REQUISITE :** **BSM 1913  
(ENGINEERING MATHEMATICS I)**

**SYNOPSIS :**

**Random Variables :** Discrete and continuous random variables, probability distribution functions, cumulative distribution functions, expected values and variance. **Special Probability Distributions :** Binomial distribution, Poisson distribution, means and variances, Poisson approximation to Binomial distribution, normal distribution, standard normal distribution, normal approximation to Binomial distribution. **Sampling Distribution :** Sampling distribution of single mean, sampling distribution of the difference between two means, sampling distribution test: *t*-distribution. **Estimation :** Point estimate, confidence interval for single mean, confidence interval for difference between two means. **Hypothesis Test :** Type 1 and type 2 errors,

hypothesis test for single mean, hypothesis test for difference between two means. **Simple Linear Regression** : Graphical method, simple linear regression model, least square method, coefficient of determination, correlation coefficient.

## REFERENCES

1. Cik Sri Mazzura, Nafisah, Kek, S.L. & Phang, P. (2007) *Engineering Statistics* (Module)
2. Douglas C. M., George C. R. , Norma Faris Hubele (2004) [\*Engineering Statistics\*](#). New York: John Wiley.
3. Robert D. M. (1994) *Statistics: An Introduction*. Sounders College Publisher, Texas.
4. William, M., Terry, S. (1992) *Statistics for Engineering and Sciences*. San Francisco: Dellen Publishing Company.
5. Allan G.B. (2001) *Elementary Statistics: A Step by Step Approach*. McGraw-Hill.

## DDA 3033

## FLUID MECHANICS

**PRE REQUISITE** : Mathematics II and Physics II

### SYNOPSIS:

Fluid Physics, Fluid Static, Fluid Kinematics, Energy and Momentum, and Dimensional Analysis.

### REFERENCES:

1. Potter, M.C. and Wiggert, D.C., (1997), *Mechanics of Fluids*, 2nd Edition, Prentice Hall.
2. Munson, B.R., Young, D.F. and Okiishi, T.H., (2002), *Fundamentals of Fluid Mechanics*, 4th Edition, John Wiley & Sons.
3. Mott, R.L., (2000), *Applied Fluid Mechanics*, 5th Edition (International Edition), Prentice Hall.
4. Rajput, R.K., (1998), *Fluid Mechanics and Hydraulic Machines*, 1st Edition (SI units), S.Chand & Company Ltd.



**DDA 3711**

**ENGINEERING LABORATORY III**

**PREREQUISITE SUBJECTS:-**

**SYNOPSIS:**

Fluid Mechanics:

Jet impact, Reynolds Number, Bernoulli Theorem, Flow in pipes, Hydrostatic pressures, Cavities in pipes

Material Sciences:

Introduction to material sciences and engineering, types of materials, atomic bonding and structure, properties of materials: density and porosity, sample preparation and metallographic, study on heat treatment such as quenching and normalisation, samples preparation for metal and study on hardness and properties of clay

**REFERENCES :**

1. Munson B. R. et. al., 1998, "*Fundamental of Fluid Mechanics*", 3rd Edition, John Wiley & Sons.
2. Mott R.L., 2000, "*Applied Fluid Mechanics*", 5th Edition, International Edition, Prentice Hall.
3. Rajput R.K., 1998, "*Fluid Mechanics and Hydraulic Machines*", 1st Edition, S. Chand & Company Ltd.
4. Shackelford, J.S., 1999, "*Introduction To Materials Science For Engineers*", 5th Edition, Prentice Hall.
5. Smith W.F., 1996, "*Principles Of Materials Science And Engineering*", 3rd Edition, McGrawHill.
6. Callister Jr. W.D., 1999, "*Materials Science And Engineering An Introduction*" 3rd Edition, Butterworth-Heinemann.

**DDA 3043**

**MECHANICS OF MACHINES**

**PREREQUISITE : DDA2063 DYNAMICS**

**SYNOPSIS :**

This subject covers several topics including gear systems, balancing, power transmission, belting, friction in screws and nut, mechanism and introduction to vibration. These essential topics in machining might provide students with proficient theoretical and graphical background in dealing with machine systems. Student will learnt to apply the principle and theory of mechanics of machine to solve system's problem such as gear system, balancing and belting system in the real engineering practice

## **REFERENCES**

1. Roslan, Che' Abas, Mohd Yunus, "Mekanik Mesin", 2001, Edisi Ketiga, Unit Penerbitan UTM.
2. B.K. Sarkar, "Theory of Machines", 2002, Tata Mc-Graw Hill
3. J.S. Hannah and R.C. Stephens, "Mechanics of Machines", 1972, Unwin Brothers Ltd.
4. John J.U, Gordon R.P, Joseph E.S," Theory of Machines and Mechanism", 2003, Oxford University N.Y.

**DD\* 2\*\*3      TECHNOLOGY ELECTIVE II (REFER PAGE..)**

**DD\* 2\*\*3      TECHNOLOGY ELECTIVE III (REFER PAGE..)**

**YEAR 3  
SEMESTER II**

**DTI 2143                      PENGATURCARAAN KOMPUTER**

**SYNOPSIS :**

Untuk memberi pengenalan kepada konsep pengaturcaraan melalui penggunaan bahasa paras tinggi seperti C. Sejarah dan evolusi bahasa pengaturcaraan, jenis-jenis data, dan operasi input dan output. Pengaturcaraan berstruktur dan kawalan: gelung while, gelung for, switch, if-else. Penggunaan fungsi, tatasusunan, struktur dan penuding.

**REFERENCES :**

1. Byron S. Gottfried, *"Programming with C"*, Mc Graw Hill, 1990
2. Baharudin Mohamed, *"Modul Pengaturcaraan ENGINEERINGC"*, KUiTTHO, 2001
3. Marini Abu Bakar et al, *"Pengaturcaraan C"*, Prentice Hall, 1999
4. Nor Haizan Mohamed Radzi, *"Pengaturcaraan C"*, UTM, 1998.

**DDA 3013                      INDUSTRIAL ENGINEERING DESIGN**

**PRE REQUISITE :** *Statics ,Dynamics ,Solid Mechanics*

**SYNOPSIS:**

*Introduction to engineering design, Standard methodology of design process, Static design failure of theories, Fatigue design failure of theories, and some standard machine components analysis such as shafts, bearings and gears.*

**REFERENCES:**

1. **Shigley, J. E., Mischke, C. R. & Budynas, R. G., (2004)**, *"Mechanical Engineering Design"*, Seventh Edition, McGraw Hill
2. **Eggert, R. J., (2005)**, *"Engineering Design"*, Pearson/Prentice Hall, New York.
3. **Spotts M.F., (1998)**, *"Design of Machine Elements - Sixth Editions"*, Prentice-Hall of India, Private Limited.
4. *"Mechanical Engineering Design Handbooks"*.

**DDA 3913**

**ENGINEERING TECHNOLOGY PROJECT**

**SYNOPSIS :**

Students should conduct and complete a project of mechanical and manufacturing engineering for a period of one semester. This project should be conducted at the end of the semester 2. The priority of the project is industrial based project which covered product design, fabrication and commissioning. Implimentation of this project is to apply theoretical knowledge into current practical applications. Execution of this project will built students communication skills, team works and competence in application technology.

**REFERENCES :**

1. Panduan Pelaksanaan Projek Kejuruteraan, FMKP

**DPK 2013**

**ASAS PERNIAGAAN  
KEUSAHAWANAN**

**DAN**

**SYNOPSIS :**

Persekitaran Ekonomi dan Pernuagaan, Bentuk Peraturan dan Kemudahan Sokongan Perniagaan, Usahawan dan keusahawanan, Kaedah mengenalpasti, mengkaji dan memilih peluang-peluang perniagaan, Bentuk, peraturan dan kemudahan sokongan perniagaan, Rancangan Perniagaan, pengurusan perniagaan kecil dan sederhana, Rancangan pemasaran, Rancangan operasi, Rancangan kewangan, Isu-isu Dalam Keusahawanan.

**REFERENCES :**

1. .... (1999), "Keusahawanan", MEDEC, UiTM
2. Saridan Abu Bakar, (1997), "Penyediaan Rancangan Perniagaan", MEDEC UiTM
3. Wan Liz Ozman Wan Omar dan Sulzari Mohamed, (2002), "Memperkasakan Usahawan: Panduan Lengkap Pengurusan Perniagaan dan Penjanaan Usahawan", Utusan Publications & Distributors Sdn Bhd
4. Robert D. Hisrich dan Michael P. Peters, (2002), "Enterpreneurship", Fifth Edition, McGraw-Hill

**DKE 3173**

**ASAS ELEKTRIK DAN ELEKTRONIK**

**SYNOPSIS :**

Asas-asas elektrik, struktur atom. Rintangan, keberaliran, kod warna, hukum Ohm, kuasa dan tenaga, litar siri dan selari mengandungi perintang, hukum-hukum Kirchhoff, medan magnet, daya gerak magnet, keamatan, kebolehtelapan, litar magnet, histerisis, hukum Faraday, hukum Fleming, hukum Lenz, kearuhan sendiri dan saling, cas, fluk elektrik, kemuatan, voltan arus ulang alik, gambarajah fasor, litar salun, pengubah satu fasa, unggul sebenar, pengaturan, kecekapan, diod, zener diod, penerus, transistor, dwi-kutub, transistor, kesan medan.

**REFERENCES :**

1. Noel Morris, *Electical and Electronic Principles*, Longman Scientific and Technical, 1980
2. E. Hughes, *Electrical Technology*, 7<sup>th</sup> Edition, Longman, 1995
3. Yahya Emant, *Prinsip Elektrik*, Dewan Bahasa dan Pustaka, 1987
4. Frank Petruzella, *Electricity and Electronics Fundamentals Book 1 & Book 2*, Mc Graw-Hill 1987

**YEAR 3  
SEMESTER III**

**DDA 3816                      INDUSTRIAL TRAINING**

**SYNOPSIS :**

Students are required to undergo industrial training as trainee engineers in mechanical engineering for a period of 12 weeks. Students will be required to follow industrial training schedule provided by the company for example planning, management, designing, evaluating, decision making, specialization and supervision. Assessment will be conducted by supervisors appointed from the faculty and the industry.

**REFERENCES:**

1. Industrial Training Log Book
2. Industrial Training Guided Book Implementation, FKMP.

## **TEXTILE ELECTIVE**

### **DDB 2033                      YARN TECHNOLOGY**

#### **SYNOPSIS:**

Introduction to Textile Industry, Fiber, Yarn, Yarn Manufacturing, Yarn Spinning Process

#### **REFERENCES:**

1. Bernard P. (1983). "*Textiles: Fiber to Fabric.*" 6<sup>th</sup> edition. New York. McGraw Hill.
2. Collier B.J. and Tortora P.G. (2001). "*Understanding Textiles.*" 6<sup>th</sup> edition. New Jersey. Prentice Hall.
3. Adanur S. (1995). "*Wellington Sears Handbook of Industrial Textiles.*" USA. Technomic Publishing Company.

### **DDB 2043                      WEAVING TECHNOLOGY**

#### **SYNOPSIS:**

Yarn Preparation Process, Weaving Technology, Fabric Defect, Application of Fabric.

#### **REFERENCES:**

1. Bernard P. (1983). "*Textiles: Fiber to Fabric.*" 6<sup>th</sup> edition. New York. McGraw Hill.
2. Collier B.J. and Tortora P.G. (2001). "*Understanding Textiles.*" 6<sup>th</sup> edition. New Jersey. Prentice Hall.
3. Adanur S. (1995). "*Wellington Sears Handbook of Industrial Textiles.*" USA. Technomic Publishing Company.

### **DDB 2053                      KNITTING TECHNOLOGY**

#### **SYNOPSIS:**

Knitting Technology, Knitted Fabric Defect, Knitted Fabric Application.





3. Adanur S. (1995). "*Wellington Sears Handbook of Industrial Textiles.*" USA. Technomic Publishing Company.
- 4.. Miles L.W.C. (1981). "*Textile Printing.*" Dyers Company Publications Trust.

## **DDB 2083                      TEXTILE TESTING**

### **SYNOPSIS:**

Testing of Fiber, Testing of Yarn, Testing of Fabric.

### **REFERENCES:**

1. Bernard P. (1983). "*Textiles: Fiber to Fabric.*" 6<sup>th</sup> edition. New York. McGraw Hill.
2. Collier B.J. and Tortora P.G. (2001). "*Understanding Textiles.*" 6<sup>th</sup> edition. New Jersey. Prentice Hall.
3. Saville B.P. (1999). "*Physical Testing of Textiles.*" The Textile Institute England. Woodhead Publishing Limited.
4. Adanur S. (1995). "*Wellington Sears Handbook of Industrial Textiles.*" USA. Technomic Publishing Company.

## **PACKAGING ELECTIVE**

### **DDC 2033                      PRINCIPLES                      OF                      PACKAGING ENGINEERING**

#### **SYNOPSIS:**

Introduction. Functions and basic materials of packaging. Basic conceptual for packaging and package system. Basic element of physical distribution. Characterisation and differentiation of product sensitivity. Selection and performance of package system. Packaging as marketing tools. Packaging and package graphic design.

#### **REFERENCES :**

1. Davis, G., 1995, *"Packaging Converting Machinery Components"*, Packaging Machinery Manufacturing, USA
2. Eldrel, E., 1993, *"Packaging Printing"*, Jelmar Publishing.
3. Hanlon, J., 1992, *"Handbook of Packaging Engineering"*, Technomic Publishing, New York.
4. C. Glenn Davis., 1990, *"Introduction to Packaging Machinery"*, Packaging Machinery Manufacturers Institute, USA.

### **DDC 2043                      PACKAGING                      MACHINERIES                      AND OPERATION**

**PRE REQUISITE :** Manufacturing Technology.

#### **SYNOPSIS :**

Operation and elements of packaging machinery. Packaging system base on pneumatics and hydraulics. Printing principles.

#### **REFERENCES :**

1. Brody, A.L and Marsh, 1997, *"The Wiley Encyclopedia of Packaging Technology"*, J. Wiley & Sons, Inc.
2. C. Glenn Davis., 1995, *"Introduction to Packaging Machinery"*, Packaging Machinery Manufacturers Association. U. S. A.
3. Eldrel, E., 1993, *"Packaging Printing"*: Jelmar Publishing.
4. Hanlon, J., 1992, *"Handbook of Packaging Engineering"*, Technomic Publishing.

**DDC 2053                      PACKAGING SYSTEM - PAPER**

**PRE REQUISITE :** Material Technology.

**SYNOPSIS :**

Packaging Material characteristic and test. Performance and test for flexible and rigid container. Basic elements for package specification. Manufacturing, production, characteristic, performance, design, test and specification of paper base package material.

**REFERENCES :**

1. Brody, A.L and Marsh.,1997, *"The Wiley Encyclopedia of Packaging Technology"*, J. Wiley & Sons, Inc
2. Eldrel, E., 1993, "Packaging Printing", Jelmar Publishing
3. Hanlon, J., 1992, "Handbook of Packaging Engineering", Technomic Publishing, New York
4. Bakker, M., 1986, "Encyclopedia of Packaging Technology", J. Wiley & Sons, Inc

**DDC 2063                      PACKAGING SYSTEM – PLASTICS, GLASS AND METALS**

**PRE REQUISITE :** Material Technology.

**SYNOPSIS :**

Packaging Material characteristic and test. Performance and test for flexible and rigid container. Basic elements for package specification. Manufacturing, production, characteristic, performance, design, test and specification of plastic, glass and metal base package materials.

**REFERENCES :**

1. Brody, A.L and Marsh.,1997, *"The Wiley Encyclopedia of Packaging Technology"*, J. Wiley & Sons, Inc
2. Eldrel, E., 1993, "Packaging Printing", Jelmar Publishing
3. Hanlon, J., 1992, "Handbook of Packaging Engineering", Technomic Publishing, New York
4. Bakker, M., 1986, "Encyclopedia of Packaging Technology", J. Wiley & Sons, Inc

**DDC 2073                      PACKAGING DYNAMICS & DISTRIBUTION**

**PRE REQUISITE :** Dynamics

**SYNOPSIS :**

Acceleration theory, vibration, damping, spring and shock. Product failure. Cushioning characteristics and design. Evaluation of cushioning system performance. Free fall / drop test, shock and vibration test.

**REFERENCES :**

5. Brody, A.L and Marsh.,1997, *"The Wiley Encyclopedia of Packaging Technology"*, J. Wiley & Sons, Inc
6. Hanlon, J.,1992, *"Handbook of Packaging Engineering"*, Technomic Publishing
7. Paine, F. A., 1991, *"The Packaging User's Handbook"*, Backie and Son Ltd
8. Richard K. Brandenburg & Julian June-Ling Lee.,1985, *"Fundamentals of packaging Dynamics"*, School of Packaging, Michigan State University, MTS System Corporation

**DDC 2083                      PACKAGING DEVELOPMENT SYSTEM**

**PRE REQUISITE :** Dynamics

**SYNOPSIS :**

Packaging development system concept. Development needs, design, cost and economy. Evolution. National packaging standards and regulations.

**REFERENCES :**

1. Ulrich, K., 2000, *"Product Design and Development"*, Mc Graw-Hill
2. Hanlon, J., *Handbook of Packaging Engineering*, Technomic Publishing, 1992
3. Paine, F. A., *The Packaging User's Handbook*, Backie and Son Ltd, 1991
4. Leornad, Edmund.,1990, *"Packaging Specification Purchasing and Quality Control"* Marcel Dekker

## **MANUFACTURING ELECTIVE**

### **DDD 2033                      DESIGN AND CAE**

**PREREQUISITE SUBJECT:** Static, Dynamic and Solid Mechanic

#### **SYNOPSIS :**

Introduction to product design, design criteria, design specification, conceptual design generation, initial design, optimization, complete design.

#### **REFERENCES :**

1. Shigley, J. E. dan Mischke, C. E., 1989. *“Mechanical Engineering Design”*, Fifth Edition, McGraw Hill.
2. Shigley, J. E., 1986. *“Mechanical Engineering Design”*, First Edition, McGraw Hill.
3. Spotts, M. F., 1988. *“Design of Machine Elements”*, Sixth Editions, Prentice Hall. Mechanical Engineering Design Handbooks.
4. Ullman, D. G., 1997. *“The Mechanical Design Process”*, Second Editions, McGraw Hill.

### **DDD 2043                      METROLOGY & MEASUREMENT**

#### **SYNOPSIS:**

Introduction to metrology, Errors In Measurement, Precise Measurement Machine And Equipment, Light Based Measuring Instrument, Fix Gauges, Limits, Fit And Tolerance, Acceptance Limits and Geometric Dimensioning, Surface Texture Measuremet, Gauge Reliability and Reproducibilit (GR&R Study)

#### **REFERENCES :**

1. S.M. Richard and J.M. Patrick, (2002), *“Geometric Tolerancing”*, 3<sup>rd</sup> ed, Mc Graw Hill.
2. K.G. Gary, (2003), *“Geometric Dimensioning and Tolerancing, Application and Inspection”*, 2<sup>nd</sup> ed, Prentice Hall,.
3. K.G.Gary, (1996), *“Statistical Process Control Methods for Long and Short Runs”*, 2<sup>nd</sup>ed, ASQC Quality Press.

4. Ted Busch, Roger Harlow and Richard Thompson, (1998), "Fundamentals of Dimensional Metrology", Delmer Publishers.

## **DDD 2053                      QUALITY CONTROL**

### **SYNOPSIS:**

This subject covers the Introduction to Quality, Quality Improvement, Statistical Process Control (SPC), Acceptance Sampling, ISO9000 and ISO14000, Reliability

### **REFERENCES:**

1. Dale H. Besterfield (2001) "Quality Control", 6th Edition, New Jersey: Prentice Hall
2. Howard S. Gitlow, Alan J. Oppenheim, Rosa Oppenheim, David M. Levine (2005) "Quality Management", 3<sup>rd</sup> Edition, New York: McGraw-Hill.
3. Dale H. Besterfield, Carol Besterfield-Michna, Glen H. Besterfield and Mary Besterfield-Sacre (2003) "Total Quality Management", 3rd Edition, New Jersey: Prentice Hall.
4. David L. Goetsch and Stanley B. Davis (2006) "Quality Management: Introduction to Total Quality Management for Production, Processing and Services", 5th Edition, New Jersey: Prentice Hall.

## **DDD 2063                      PNEUMATICS AND HYDRAULICS**

### **SYNOPSIS:**

Load system determination, actuators system, rotation system, power distribution system, operation and system analysis, system technology and dynamic aspect system.

This subject covers the Introduction to Quality, Quality Improvement, Statistical Process Control (SPC), Acceptance Sampling, ISO9000 and ISO14000, Reliability

### **REFERENCES:**

1. Module H2 : "Design of Hydraulic Systems", Fluid Power Centre, University of Bath, UK.
2. Esposito, "Fluid Power with Application", Prentice Hall.
3. Pinches/Wan Sani, "Hidraulik Kuasa", Penerbit, UTM.
4. "Fluid Power", Bolton, Prentice Hall.

**DDD 3323 METAL CASTING**

**SYNOPSIS :**

Introduction in metal casting, metal casting process, pattern, sand mold, molding system (gating and risering system), melting and pouring technology, modernization and control mechanism in foundry.

**REFERENCE :**

1. Ammen C. W., "Metalcasting", 2000, McGraw Hill, New York.
2. Clegg A. J., "Precision Casting Processes", 1991, Pergamon Press, New York.
3. Jain P. L., "Principles of Foundry Technology", 1995, Third Edition, Tata McGraw Hill, New Delhi.
4. Kalpakjian S. and Schmid S. R., "Manufacturing Engineering and Technology", 2001, Fourth Edition, Prentice Hall, London.

**DDD 3623 RAPID PROTOTYPING**

**SYNOPSIS :**

Introduction-Defination of Rapif Prototyping(RPT), Beginner of Rapid Prototyping, Design Process, Cycle on RP, Modelling Concept, Modelling Function, Application of Secondary RP, International RP System.

**REFERENCES :**

1. Dr. Marshal Burns, 1993. "Automated Fabrication", Prentice Hall.
2. Jacobs P.F., Editor, 1992. "Rapid Prototyping & Manufacturing : Fundamentals of Stereolithography", SME.
3. Alain Bernard & Geoge Taillandier, 1998. "*Le Prototypage Rapide*", Hermes Edition.

## **AUTOMOTIVE ELECTIVE**

### **DDE 2033 CHASSIS SYSTEM**

#### **SYNOPSIS:**

Functions of suspension, suspension system components, mechanisms and suspension models, functions of wheel, wheel structure, wheel alignment, brake mechanism including ABS, steering mechanism, four wheel drives. Tests on the operation of suspension, brake, steering and wheels systems.

#### **REFERENCES:**

1. Birch T and Thomson, (1999), "*Automotive Suspension and Steering Systems*", 3rd Edition, Delmar Publisher.
2. James D. Halderman (1991), "*Automotive Brake Systems*", 2nd Edition, Prentice Hall.
3. Knowles D, (2003), "*Today's Technician: Automotive Suspension and Steering Systems*", Delmar Publisher.
4. Thomas W. Birch, (2000), "*Automotive Chassis Systems*", Delmar Thomson Learning.

### **DDE 2043 TRANSMISSION AND TRANSAXLE SYSTEM**

#### **SYNOPSIS:**

Types and elements of drivetrain, clutch, manual transmission, automatic transmission, final drive, four wheel drives. Tests on the operation of manual transmission, automatic transmission, drive axles and differential systems.

#### **REFERENCES:**

1. Brejcha M, Turri R and Thomson, (1997), "*Automatic Transmission and Transaxles*", 4th Edition, Delmar Publisher.
2. Erjavec J and Thomson, (2000), "*Automotive Technology: A Systems Approach*", 3rd Edition, Delmar Publisher..
3. Erjavec J and Thomson, (1997), "*Manual Transmission and Transaxle*", 2nd Edition, Delmar Publisher.
4. Erjavec J and Thomson, (1999), "*Today's Technician: Automatic Transmission and Transaxles*", 2nd Edition, Delmar Publisher.



## **DDE 2053                      AUTOMOTIVE WORKSHOP MANAGEMENT**

### **SYNOPSIS:**

Safety in workshop, basic in industry, business planning, advertisement, price control, financial planning, business law and government regulations in automotive workshop. Each student will be required to write paperwork to setup an automotive workshop.

### **REFERENCES:**

1. Angelo Kinicki, Brian K. Williams, (2003), "*Management: A Practical Introduction*", McGraw-Hill.
2. Clark, L. Gordon, Jonson, Elizabeth Prior, (1995), "*Management Ethics: Theory, Cases and Practice*", Australia: HarperEducational.
3. David Boddy, (1998), "*Management: An Introduction*", 2nd edition, England: Pearson Education.
4. Dubrin, Andrew J, (1993), "*Management and Organization*", South-Western Publishing Co.

## **DDE 2083                      VEHICLE AIR-CONDITIONING**

### **SYNOPSIS:**

Basic heat transfer, thermal comfort characteristics, components and vehicle air condition. Diagnostic and design of manual and automatic control modes.

### **REFERENCES:**

1. Boyce H. Dwiggin (1995), "Automotive Air Conditioning", 7th Edition, Prentice Hall.
2. Jones W. P., (1997) "Air conditioning Application and Design", 2nd Edition, Oxford: Butterworth – Heinemann.
3. Jones W. P., (2001), " Air conditioning Engineering", 5th Edition, Edward Arnold.
4. Tom Birch (2000) "Automotive heating and Air Conditioning", 3rd Edition, Prentice Hall.

**DDE 2063                      ELECTRIC AND COMPUTER CONTROL IN  
AUTOMOTIVE**

**PREREQUISITE SUBJECTS:-**

**SYNOPSIS:**

Theoretical: Wiring and circuitry diagrams, Vehicle battery, Direct current motor and starter, Charging system, Lighting circuit, Electrical accessories, Vehicle computer system

Practice: Diagnosis and testing of components and starter system, charging system, Lighting and electrical accessories, Maintenance of vehicle computer system

**REFERENCES :**

1. Hollembeak B.A., (1999), "*Automotive Electricity, Electronics and Computer Controls*", 1st Edition, Delmar Publishers.
2. Hollembeak B.A., (2003), "*Classroom Manual For Automotive Electricity and Electronics*", 3rd Edition, Thomson.
3. King D, (1996), "*Computerized Engine Control*", 5th Edition, Thomson.
4. Robert N. Brady, (2001), "*Automotive Electronics and Computer System*" Prentice-Hall.
5. Santni A., (1997), "*Automotive Electricity and Electronics*", 3rd Edition, Thomson.

**DDE 2073                      INTERNAL COMBUSTION ENGINE**

**SYNOPSIS:**

Theories: Introduction to internal combustion engines, Engine cycles, Spark ignition engines, Compression ignition engines, Conventional fuels, Emissions, Internal combustion engine testing

Practices: Diagnosis and testing on petrol and diesel fuelled engines

**REFERENCES:**

1. Heywood, J. B., (1988) *Internal Combustion Engine Fundamentals*, Singapore, McGraw Hill Book Co.
2. Pulkrabek, W. W. (2003) *Engineering Fundamentals of the Internal Combustion Engine*, Prentice Hall

3. Ferguson, C. R. and Kirkpatrick, A. T., (2001) *Internal Combustion Engine: Applied Thermoscience*, USA, John Wiley & Sons, Inc.
4. Stone, R. (1993) *Introduction to Internal Combustion Engines*, SAE International

## **DDE 2093**

## **COMBUSTION AND EMISSIONS CONTROL**

### **SYNOPSIS:**

Theories: Thermodynamics of combustion, Characteristics of exhaust gases, Combustion of gaseous fuel, Combustion of liquefied fuel, Exhaust system, Catalytic converter, Emissions testing and control for spark-ignition and compression-ignition engines

Practices: Test and analysis of exhaust gases emissions.

### **REFERENCES:**

1. Colin R.Ferguson, (2001), *"Internal Combustion Engines"*, 2nd Edition, John Wiley and Sons.
2. De Nevers N., (1995), *"Air Pollution Control Engineering"*, McGraw-Hill.Stone
3. Escalambre, (1995), *"A Technician's Guide To Advanced Automotive Emission Systems"*, Thomson.
4. R. Stone (Terjemahan Khalid Hasnan), (1997), *"Pengenalan Kepada Enjin Pembakaran Dalam Ed. 2"*, Penerbit UTM.

## **PLANT ELECTIVE**

### **DDF 2033 SAFETY ENGINEERING**

#### **SYNOPSIS:**

This course gives students exposure to the basic of occupational safety and health, standards and codes involved, types of risks and hazards, cause and contributing factors in accident, safety rules and accident prevention.

#### **REFERENCES:**

1. David, L. G., (2002) *Occupational Safety and Health for Technologist, Engineers and Managers*, 4<sup>th</sup> Edition, Prentice Hall
2. Hammer, W. and Price, D., (2001) *Occupational Safety Management and Engineering*, 5<sup>th</sup> Edition, Prentice Hall
3. William, F. M., James B. W. and Butterworth H., (2001) *Safety and Health Essentials for Small Business*, Bostan
4. James, C. V., (1995) *Safety Engineering*, New York, John Wiley

### **DDF 2053 PLANT ENGINEERING**

#### **SYNOPSIS:**

This course describes the functions of plant engineering. Process scheduling, plant equipment arrangements and material handling are also covered. Utility requirements including electrical power generation and lubrication systems will be included. Topics in plant control system and maintenance of equipment will be discussed.

#### **REFERENCES:**

1. R. Keith Mobley; *Plant Engineer's Handbook*, ISBN 0 7506 7328 1, Butterworth-Heinemann, 2001
2. Tompkins/White/Bozer/Frazelle/Tanchoco/Trevno, *Facilities planning*, second edition, ISBN 0-471-00252-6; John Wiley & Sons, Inc;1996
3. American Petroleum Institute; *Pipeline Electrical and Instrumentation, level two Trainee Guide*; ISBN 0-13-046691-3; Pearson Education Publisher; 2002.
4. Japan Institute of Plant Maintenance; *TPM for Every Operator*, ISBN 1-56327-080-3; Productivity Press; 1996

**DDF 2043**

**BOILER ENGINEERING**

**SYNOPSIS:**

This course discusses the functions and application of boilers in industries. Major equipment of boiler systems such as burner, system trap, and pipelines will be elaborated during the class rooms and lab practices. The functions of plant engineering, Steam turbines, pumps, motor, and bearings will be included. Water treatment is also covered in this course at a separate topic.

**REFERENCES:**

1. Theodore B. Sauselein; *Boiler Operator's Exam Preparation*; Mc Graw Hill; ISBN 0-07-057968-7; 1995
2. R. Dean Wilson; *Boiler Operator's Workbook*; American Technical Publisher; ISBN 0-8269-4493-0; 1995
3. James J. Jackson; *Steam Boiler Operation*; Prentice Hall Inc; ISBN 0-13-846311-5; 1980
4. R. Keith Mobley; *Plant Engineering's Handbook*; ISBN 0 7506 7328 1; Butterworth-Heinemann; 2001

**DDF 2063**

**PROCESS CONTROL SYSTEMS OF STEAM POWER PLANT**

**SYNOPSIS:**

Basics to process control theories and system modelling will be introduced in this course. Switches, transmitters, controllers, and control valves as the control elements are parts of the major topics described. Types of the metering devices and network communications for data transmission are also introduced.

**REFERENCES:**

1. Roy E. Fraser; *Process Measurement and Control – Introduction to Sensors, Communication, Adjustment, and Control*; ISBN 0-13-022211-9; Prentice Hall; 2001
2. James K. Gould; *Controllers and Control Elements*; ISBN 0-87664-662-3; Publisher Creative Services Inc; 1982.
3. Denis Green, Jonathan F. Gosse; *Industrial Maintenance*; ISBN - 8269-3602-4; American Technical Publishers; 2000
4. Howard F. Tucker, *Automatic Transmission*; By Delmar Publisher Inc; ISBN: 0-8273-1648-8;1980

**DDF 2083**

**AIR CONDITIONING SYSTEM DESIGN**

**PRE REQUISITE :** Thermodynamics

**SYNOPSIS:**

This course discusses the air conditioning principles, psychometric process, heat load calculation, thermal comfort and air conditioning noise control.

**REFERENCES:**

1. *Air Conditioning Principles and Systems: An Energy Approach*, Edward G. Pita, John Wiley & Sons.
2. *Heating, Ventilating and Air Conditioning: Analysis and Design*, Faye C. McQuiston and Jerald D. Parker, 4<sup>th</sup> edition, John Wiley & Sons Inc, 1994.
3. *Practical Cooling Technology*, Johnson W. Delmar, 1997
4. *Electricity for Refrigeration, Heating and Air-Conditioning*, 5<sup>th</sup> edition, Smith RE, 1997

**DDF 2073**

**APPLIED THERMODYNAMICS**

**PRE REQUISITE :** Thermodynamics

**SYNOPSIS:**

The course emphasizes on the application of thermodynamics laws in engineering applications, exposing the working principle of power plants, machines and engines that operate based on thermodynamics system. The systems include steam and gas power plants, heat pump and refrigeration system, reciprocating compressor, internal combustion engines and non reactive mixtures, and cooling tower system.

**REFERENCES:**

1. *Fundamentals of Heat and Mass Transfer*, Incopera, F. P. and DeWitt, D. P., Wiley, 2002.
2. *Practical Heating, Ventilation, Air Conditioning and Refrigeration*, Henry Puzio and Jim Johnson, Delmar, 1996.
3. *Thermodynamic: An Engineering Approach*, Cengel Y.A. and Boles M.A. McGraw Hill, 2002.
4. *Eastop T.T & McConkey A., (1994), "Applied Thermodynamics For Engineering Technologist: Fifth Edition", Longman, Essex.*