

YEAR 1

YEAR 1

SEMESTER 1

UWS 10103 NATIONHOOD AND CURRENT DEVELOPMENT OF
MALAYSIA

SYNOPSIS:

Kursus ini membincangkan konsep asas, proses pembentukan dan pembangunan Malaysia. Ia merangkumi Empayar Kesultanan Melayu Melaka, imperialisme dan kolonialisme, patriotisme dan nasionalisme serta seterusnya kemerdekaan dan penubuhan Malaysia. Selain itu, turut disentuh ialah perlembagaan dan sistem kerajaan Malaysia serta dasar-dasar utama pembangunan negara. Antara lain, peranan dan tanggungjawab warganegara juga ditekankan selain kejayaan dan cabaran Malaysia.

REFERENCES:

1. Zahrul Akmal Damin, Fauziah Ani, Lutfan Jaes, Khairunesa Isa, Siti Sarawati Johar, Harliana Halim, Khairul Azman Mohd Suhaimy, Shamsaadal Sholeh Saad, Ku Hasnan Ku Halim dan Mohd Akbal Abdullah (2009). "Kenegaraan & Pembangunan Malaysia." Batu Pahat: Penerbit UTHM.
2. Ahmad Esa, Harliana Halim, Khairul Azman Mohd Suhaimy, Ku Hasnan Ku Halim, Marwan Ismail, Mohd Akbal Abdullah, Shamsaadal Sholeh Saad dan Zahrul Akmal Damin (2004). "Ikhtisar Sejarah Kenegaraan & Pembangunan Malaysia." Johor Bahru: Muapakat Jaya Percetakan Sdn. Bhd.
3. Kassim Thukiman (2002). "Malaysia: Perspektif Sejarah dan Politik." Skudai: Penerbit Universiti Teknologi Malaysia.
4. Nazaruddin Mohd Jali, Ma'rof Redzuan, Asnarulkhadi Abu Samah dan Ismail Mohd Rashid (2005). "Pengajian Malaysia." Petaling Jaya: Prentice Hall.
5. Ruslan Zainudin, Mohd Mahadee Ismail dan Zaini Othman (2005). "Kenegaraan Malaysia." Shah Alam : Fajar Bakti.

UWA 10102 ISLAMIC STUDIES

SYNOPSIS:

Kursus ini menerangkan tentang konsep Islam sebagai al-Deen. Skop perbincangannya meliputi pengajian al-Quran dan al-Hadith; Akidah Ahli Sunnah wal Jamaah; aliran pemikiran akidah; perkembangan mazhab Fiqh; prinsip muamalat; Undang-undang Jenayah Islam; etika kerja dalam Islam; isu-isu dalam Undang-undang kekeluargaan Islam serta isu-isu semasa.

REFERENCES:

1. Harun Din, (Dr.), (2001), *Manusia Dan Islam*, Kuala Lumpur: Dewan Bahasa dan Pustaka.
2. Ismail Hj. Ali, (1995), *Pengertian dan Pegangan Iktikad yang benar: Ahli Sunnah Wal Jamaah*: Kuala Lumpur: Penerbitan al-Hidayah
3. Mustafa Abd. Rahman, (1998), *Hadith Empat Puluh*, Kuala Lumpur: Dewan Pustaka Fajar.
4. Mustafa Hj. Daud, (1995), *Konsep Ibadah Menurut Islam*, Kuala Lumpur: Dewan Pustaka dan Bahasa.
5. Paizah Hj. Ismail, (1991), *Undang-undang Jenayah Islam*, Kuala Lumpur: Dewan Pustaka Islam, Angkatan Belia Islam Malaysia.

UWA 10202 MORAL STUDIES

SYNOPSIS:

Kursus ini menerangkan tentang pengenalan kepada konsep moral, aspek-aspek moral dan kepentingannya dalam kehidupan seharian. Teori moral Barat serta nilai-nilai murni agama besar di dunia. Moral dalam pekerjaan dan akhirnya isu-isu moral semasa.

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.

UQ* 1**01 C0-CURRICULUM 1

SYNOPSIS:

Kursus ini ditawarkan dalam pelbagai bentuk aktiviti pilihan untuk pelajar peringkat Sarjana Muda dan Diploma. Lapan bidang aktiviti yang ditawarkan adalah Pengucapan Awam, Keusahawanan, Sukan, Khidmat Komuniti, Kesukarelawanan, Kepimpinan, Kebudayaan dan Daya Usaha dan Inovasi.

UWB 10101 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 for 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.

UWB 1**02

MALAY LANGUAGE

SYNOPSIS:

This course is designed for students to learn the basic of Bahasa Melayu. 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 Bahasa Melayu.

REFERENCES:

1. Asmah Hj. Omar. (2005). Susur Galur Bahasa Melayu. DBP : KL
2. Asmah Hj. Omar. (2003). Nahu Melayu Mutakhir. DBP : KL
3. Abdul Hamid Mahmood. (1992). Menguasai Ejaan Bahasa Malaysia Dengan Cepat. DBP: KL
4. Abdul Hamid Mahmood. (1998). Menguasai Ejaan Bahasa Melayu. DBP : KL
5. Edward S. King. (1998). Speak In Malay. Times Publication : KL

BWM 10103

ENGINEERING MATHEMATICS 1

SYNOPSIS:

Limits and Continuity: Techniques of finding limits. Continuity. Differentiation and Applications: Techniques of differentiation: product rule, quotient rule. Chain rule. Implicit differentiation. Higher derivatives. Differentiation of implicit functions, parametric equations and inverse functions. Applications: rates of change, maximum and minimum problems, sketching rational functions. L'Hopital's Rule: Indeterminate form of type $0/0$, ∞/∞ , $0 \bullet \infty$, 0^0 , ∞^0 , 1^∞ , $\infty - \infty$. Integration: Techniques of integration: integration by substitution, integration by parts, integrating rational functions, integrating power of trigonometric functions, rational functions of sine and cosine, integrating hyperbolic functions and integration by trigonometric and hyperbolic substitution. Further Differentiation and Integration and Applications: Derivatives and integrals involving inverse trigonometric and hyperbolic functions. Applications: arc length, surface area of revolution, curvature. Power Series: Convergence test. Conditional and absolute convergence. Power series: Taylor and Maclaurin series. Differentiation and integration of power series.

REFERENCES:

1. Abd. Wahid Md. Raji, Hamisan Rahmat, Ismail Kamis, Mohd Nor Mohamad, Ong Chee Tiong. (2003). "Calculus for Science and Engineering Students." Malaysia: UTM Publication.
2. Anton, H., Bivens, I., Davis, S. (2005). "Calculus." 8th Ed. USA: John Wiley & Sons, Inc.
3. Smith, R. T., Minton, R. B. (2006). "Calculus: Concept & Connection." New York: McGraw-Hill.
4. Larson, R. E., Hostetler, R. P., Edward, B. H. (2002). "Calculus with Analytic Geometry." 6th Ed. USA: Houghton Mifflin Company.
5. Goldstein, Larry, Lay, David, Schneider, David. (2004). "Calculus and its Applications. Upper Saddle River, NJ : Pearson Education.

BEC 10102 COMPUTER PROGRAMMING

SYNOPSIS:

This course is intended to provide a study of programming concept through the use of a high level programming language such as C++. Students will learn to design, code, debug, test and document well-structured programs based on technical and engineering problems. Topic covered; Software Development Method, programming language basics, data types , input and output operations, the use of arrays, string, pointers and structures, file processing handling and advance applications.

REFERENCES:

1. Delores M. Etter, Jeanine A. Ingber. Engineering Problem Solving with C++, 2nd. Edition. Prentice-Hall, 2007.
2. Jeri R. Hanly, Elliot B. Koffman. Problem Solving and Program Design in C, 4th. Edition. Addison-Wesley, 2004.
3. Katupitiya, Jayantha, Bentley, Kim. Interfacing with C++, Springer, 2006.
4. Jeri R. Hanly, Elliot B. Koffman. C Programming for Engineers, 2nd Edition, Addison-Wesley, 2004.
5. H. M. Deitel and P. J. Deitel, C: How to Program, 4th Edition, Prentice-Hall, 2004

BEF 12302 DIGITAL TECHNIQUES

SYNOPSIS:

This subject is the first course in digital electronics. Beginning with representing physical values in digital form using binary, octal and hexadecimal numbering system, conversion between these numbering systems, also representation of values in codes such as BCD and Gray. This is followed by representing negative values in binary, binary arithmetic and BCD addition. Basic logic gates and symbols are introduced as well as Boolean expressions, truth tables and timing diagrams. Combining basic gates to implement certain function, and analyzing circuits to obtain its Boolean expression, simplify using Boolean theorem and Karnaugh-map approach. In digital arithmetic, adder circuits are introduced, starting from half adder, full adder and the design of the carry look ahead adder and BCD adder. Then, on to MSI logic circuits such as encoder, decoder, multiplexer and demultiplexer. Memory elements such as latches and flip-flops are introduced followed by flip-flop applications in counters and registers.

REFERENCES:

1. Stephen Brown, Zvnko Vranesic, Fundamental of Digital Logic with VHDL, McGraw Hill, 2005.
2. J. Floyd, Digital Fundamental, Merill MacMillan, 2006.
3. J. Tocci, Digital System, Principles and Application, Prentice Hall, 2006
4. M. Morris Mano, Charles R. Kime, Logic and Computer Design Fundamentals, 2nd Ed., Prentice Hall, 2001.
5. Milos D. Ercegovac, Thomas Lang and Jaume H. Moreno, Introduction to Digital System, John Wiley, 1999.
6. Floyd, Digital Fundamentals with VHDL, Prentice Hall, 2003. Jeffrey S. Beasley, Gary M. Miller, Modern Electronic Communication 9th Ed., Pearson Prentice Hall 2008.

BEF 12403 ELECTRIC CIRCUIT ANALYSIS I

SYNOPSIS:

This subject introduces the circuit's laws and analytical techniques to analyse circuits in the dc steady-state, dc transient state, ac transient state and ac steady-state for current, voltage and power. Topics include circuit analysis of resistive and reactive networks using loop method, node-voltage and mesh-current methods, complex exponent, phasors, and also power calculations in the time domain and using the complex power concept.

REFERENCES:

1. Charles J Monier, Electric Circuit Analysis, Prentice Hall, 2001
2. Hayt W H, Kemmerly J E, Durbin S M, Engineering Circuit Analysis, 6th Edition, McGraw-Hill, 2002.
3. Irwin J D, Basic Engineering Circuit Analysis, MacMillan, 1990
4. Ali Aminian, Marian Kazimierzuk, Electronic Principles, Pearson Prentice Hall, 2004,
5. K V Ramanan Functional Electronics, Tata McGraw-Hill, 1984,
6. Albert Paul Malvino, Electronic Principles, 5th Edition, Macmillan/mcGraw-Hill,
7. P R Belanger, E L Adler, N C Rumin, Introduction to Circuits with Electronics, Holt-Sauders International Editions, 1985,

YEAR 1

SEMESTER 2

UWS 10202 ETHNICS RELATIONS

SYNOPSIS:

Kursus ini memfokuskan tentang konseptual dan praktikal hubungan etnik dalam kerangka masyarakat Malaysia. Perbincangan adalah merangkumi konsep-konsep asas hubungan etnik dan diteruskan dengan penyelurusan sejarah pembinaan masyarakat plural. Selain itu, turut disentuh ialah perlembagaan sebagai teras kehidupan bermasyarakat. Perbincangan juga meneliti hubungkait pembangunan dengan etniksiti dari aspek ekonomi, politik dan sosial berdasarkan pendekatan *top-down* dan *bottom-up* oleh kerajaan serta masyarakat.

REFERENCES :

1. Shamsul Amri Baharuddin (2007). "Modul Hubungan Etnik." Shah Alam: Universiti Teknologi MARA.
2. Zaid Ahmad, Ho Hui Ling, Sarjit Sing Gill dll (2006). "Hubungan Etnik di Malaysia." Shah Alam : Oxford Fajar Sdn. Bhd.
3. John Rex (1985). "Hubungan Ras Dalam Teori Sosiologi." Kuala Lumpur : Dewan Bahasa dan Pustaka..
4. Lembaga Penyelidikan Undang-undang (2003). "Perlembagaan Persekutuan : (hingga 15hb.Ogos 2003)." Petaling Jaya : International Law Book Services.
5. Nazaruddin Mohd Jali, Ma'rof Redzuan, Asnarulkhadi Abu Samah dan Ismail Mohd Rashid (2005). "Pengajian Malaysia." Petaling Jaya: Prentice Hall.

UWB 10202 EFFECTIVE COMMUNICATION

SYNOPSIS:

This course emphasizes 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, teamwork, 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 conducting interview.

REFERENCES:

1. Cheesebro, T., O'Connor, L. & Rios, F. (2007). *Communication skills : preparing for career success* (3rd ed.) Upper Saddle River, NJ: Pearson.
2. Davies, W.J. (2001) *Communication skills : a guide for engineering and applied science student* (2nd ed.) . London: Prentice Hall.
3. Joan van Emden, L. (2004). *Presentation skills for students*. New York: Palgrave Macmillan.
4. Richard Johnson-Sheehan (2005). *Technical Communication Today*. New York: Pearson.
5. Salbiah Seliman et. al. (2004). *English Communication for learners in engineering*. Malaysia: Prentice Hall.

UQ* 1**01 CO-CURRICULUM II

SYNOPSIS:

Kursus ini ditawarkan dalam pelbagai bentuk aktiviti pilihan untuk pelajar peringkat Sarjana Muda dan Diploma. Lapan bidang aktiviti yang ditawarkan adalah Pengucapan Awam, Keusahawanan, Sukan, Khidmat Komuniti, Kesukarelawanan, Kepimpinan, Kebudayaan dan Daya Usaha dan Inovasi.

UWS 10303 MALAYSIAN STUDIES AND CULTURE

SYNOPSIS:

This course will provide students in depth understanding of Malaysia from various perspectives. Topics to be discussed include Malaysia in relation to its history, achievement and international affairs. In addition, students will also be exposed to the ethnic composition of the country, culture and heritage. Teaching and learning process enables student to acquire knowledge and appreciates the reality of life in Malaysia through experiential learning.

REFERENCES:

1. Abdul Halim Nasir (2004). "Mosque Architecture in the Malay World." Bangi : Penerbit Universiti Kebangsaan Malaysia.
2. "Ensiklopedia Sejarah Kebudayaan Melayu." (1998). Kuala Lumpur : Dewan Bahasa dan Pustaka

3. Khoo Kay Kim (2001). "Malay Society: Transformation and Democratisation." Kelana Jaya : Pelanduk Publications.
4. Nazaruddin Mohd. Jali (2003). "Malaysian Studies : Nationhood and Citizenship." Petaling Jaya : Pearson Prentice Hall.
5. Yahaya Ismail (1989). "The Cultural Heritage of Malaysia." Kuala Lumpur : Dinamika Kreatif Sdn. Bhd.

BWM 10303

ENGINEERING MATHEMATICS IIE

SYNOPSIS:

First Order Differential Equation: Formation. Methods of solution: separating the variables, homogeneous, linear and exact. Initial value problem. Application: electric circuit. Second Order Linear Differential Equation with Constant Coefficients: Methods of solution: method of undetermined coefficient and method of variation of parameter. Application of second order linear differential equation with constant coefficients in electric circuit. System of First and Second Order Differential Equations: Eigen value and eigen function. Laplace Transform: Definition. Linearity. First shift theorem. Multiplying by t . Unit step function and Delta function. Second shift theorem. Inverse Laplace Transform: Definition and properties. Convolution theorem. Solve initial and boundary value problems for linear differential equation with constant coefficients which involve unit step function, Dirac Delta function and periodic function. Fourier Series: Fourier series in interval period 2π . Odd and even function. Fourier series in interval $(-l, l)$. Half range series. Introduction of Fourier transform. Series Solution for Differential Equation: Power series method. Legendre polynomial. Bessel equation.

REFERENCES:

1. Abd. Wahid Md. Raji, Mohd Nor Mohamad. (2008). *Differential Equations for Engineering Students*. Malaysia: Comtech Marketing Sdn. Bhd.
2. Kuldeep Singh. (2003). *Engineering Mathematics through Applications*. New York: Industrial Press.
3. Peter V. O'Neil. (2003). *Advanced Engineering Mathematics*. Thomson Brooks/Cole.
4. Phang, C., Phang, P. (2007). *Engineering Mathematics II BSM 1933 (Learning Module)*. Malaysia: UTHM Publication.
5. Robert J. Lopez. (2001). *Advanced Engineering Mathematics*. Boston: Addison Wesley.

UWA 10302 ISLAMIC AND ASIAN CIVILISATION (TITAS)

SYNOPSIS:

Kursus ini membincangkan tentang pengenalan ilmu ketamadunan; perkembangan tamadun; Interaksi antara tamadun; Tamadun Islam; Islam dalam Tamadun Melayu; Isu-isu kontemporari tamadun serta prinsip Islam Hadhari.

REFERENCES:

1. Ahmad Hakimi Khairuddin dan Faridah Che Husain. (2006). Isu-isu Kontemporari Dalam Tamadun Islam dan Tamadun Melayu, dalam *Tamadun Islam dan Tamadun Melayu*. Siri Teks Pengajian Tinggi. Kuala Lumpur: Penerbit Universiti Malaya
2. Ibnu Khaldun, Muqaddimah Ibnu Khaldun.
3. Huntington, S. *The Clash of Civilizations and the Remaking of the World Order*.
4. Mahyuddin Hj. Yahaya, (1998). *Tamadun Islam*, Shah Alam: Penerbit Fajar Bakti Sdn. Bhd.
5. Iddaikkadar. N.M. (1979). *Latar Belakang Kebudayaan Hindu*. Kuala Lumpur: Dewan Bahasa dan Pustaka.

BEF 12503 ELECTRIC CIRCUIT ANALYSIS II

SYNOPSIS:

This subjects the circuit's laws and analytical techniques to analyse circuits in the dc steady-state, dc transient state, ac transient state and ac steady-state for current, voltage and power. Topics include circuit analysis of resistive and reactive networks using loop method, node-voltage and mesh-current methods, complex exponent, phasors, and also power calculations in the time domain and using the complex power concept.

REFERENCES:

1. Charles J Monier, Electric Circuit Analysis, Prentice Hall, 2001
2. Hayt W H, Kemmerly J E, Durbin S M, Engineering Circuit Analysis, 6th Edition, McGraw-Hill, 2002.
3. Irwin J D, Basic Engineering Circuit Analysis, MacMillan, 1990
4. Ali Aminian, Marian Kazimierzczuk, Electronic Principles, Pearson Prentice Hall, 2004.
5. K V Ramanan Functional Electronics, Tata McGraw-Hill, 1984,
6. Albert Paul Malvino, Electronic Principles, 5th Edition, Macmillan/McGraw-Hill

BEF 12603 ELECTRONIC CIRCUIT THEORIES

SYNOPSIS:

This course introduces the principles and techniques of analyzing the operation of nonlinear circuits especially those commonly found in electronics. Topics include graphical method of analysing nonlinear circuits containing two- and three-terminal electronic devices such as pn junction diodes, LEDs, zener diodes, BJTs, FETs, and SCRs; piecewise linear modeling of nonlinear two-terminal and three-terminal resistors and the application of these models in circuit analysis; concept of negative feedback and its applications in modifying network properties; and applications of the voltage operational amplifier as a practical two-port network with negative feedback.

REFERENCES:

1. Norbert R Malik, *Electronic Circuits*, Prentice Hall, 1995.
2. Robert A. Bartkowiak, *Electric Circuit Analysis*, John Wiley & Sons, New York, 1985.
3. Raymond A. DeCarlo, Pen-Min Lin, *Linear Circuit Analysis*, Vol. 1, Prentice Hall, 1995.
4. David R Cunningham, John A Stuller; *Circuit Analysis*, 2nd Edition; John Wiley & Sons, 1995.
5. Bruce A Carlson, David G. Gisser; *Electrical Engineering*, Addison-Wesley Publishing Co., 1981.
6. Ali Aminian, Marian Kazimierczuk, *Pearson Prentice Hall*, 2004.
7. K V Ramanan *Functional Electronics*, Tata McGraw-Hill, 1984.
8. Albert Paul Malvino, *Electronic Principles*, 5th Edition, Macmillan/McGraw-Hill, 2005
9. P R Belanger, E L Adler, N C Rumin, *Introduction to Circuits with Electronics*, Holt-Sauders International Editions, 1985.

YEAR 2

YEAR 2

SEMESTER 1

UWB20302 TECHNICAL WRITING

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. The data collected will be analyzed, transferred into graphic forms and presented orally and in writing. Prior to that, students will also be trained to polish up their skills in narrative 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 Muffin 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.

BWM20403 ENGINEERING MATHEMATICS III

SYNOPSIS:

Functions of Several Variables: Domains, ranges, contour line, level curves and 3D-graphs. Partial derivatives and chain rules. Mixed derivatives. Total differentials and exact differentials. Local and absolute extreme values of functions of two variables. Multiple Integrations: Double integrals: Areas and volumes. Double integrals in polar coordinates. Surface areas. Triple integrals: Volumes. Triple integrals in cylindrical and spherical coordinates. Center of mass, center of gravity and inertial moments. Vector-valued Functions: Definition and graphs. Differentiations and integrations. Tangent vectors, normal vectors, arc length and curvature. Motion in a plane curve. Directional derivatives and gradients of functions of two variables. Vector Calculus: Line integrals of scalar and vector field. Independence of path and conservative

vector field. Green Theorem. Surface integrals of scalar and vector field. Gauss's Theorem and Stokes Theorem.

REFERENCES :

1. Abd Wahid Md Raji, Phang Chang, Phang Piau, (2007) Engineering Mathematics III BSM2913. Penerbit UTHM. (Learning Module)
2. Howard Anton, Irl Bivens, Stephen Davis (2002). Calculus (7th Edition). New York:
3. John Wiley. Straud, K.A. (1996). Further Engineering Mathematics (3rd Edition). England: Macmillian Publication
4. Robert T. Smith, and Roland B. Minton (2007). Calculus Early Transcendental Function (3rd Edition). New York: McGraw-Hill.
5. James Stewart (2003). Calculus. USA. Thomson Learning Inc.

BPK20802

ENTREPRENEURSHIP

SYNOPSIS:

Kursus ini memberi pendedahan kepada pelajar tentang aspek asas keusahawanan. Kursus ini meliputi empat modul utama iaitu pemupukan budaya keusahawanan, peluang dan rancangan perniagaan, praktikum keusahawanan dan pembentangan laporan aktiviti keusahawanan.

REFERENCES:

1. Kementerian Pengajian Tinggi (2007) 'Asas Pembudayaan Keusahawanan'. Penerbit UUM;
2. Marc J. Dollinger. – 3rd ed. (2003), 'Entrepreneurship; Strategic and Resources'. Prentice Hall Pearson Malaysia Sdn. Bhd.
3. UiTM Entrepreneurship Study Group (2004), 'Fundamentals of Entrepreneurship' Prentice Hall Pearson Malaysia Sdn. Bhd.
4. Carol Yip (2007) 'Smart Money-User' Kanyin Publication.
5. Agensi Kaunseling and Pengurusan Kredit (2009) 'Money Sense-Getting Smart with Your Money. 2nd Edition

BEE 31202 CREATIVITY AND INNOVATION

SYNOPSIS:

This course focuses on developing a creative person who will eventually think strategically, creatively and critically. The knowledge and skills acquired throughout the course will later be applied by the students in solving problems and making decisions in the future. In this course, students will be exposed to various creativity and problem solving techniques. Some of the skills to be covered throughout the course are problem solving, techniques in creativity and techniques in innovation.

REFERENCES:

1. Bernacki, E. (2002). *Wow! That's a Great Idea!*. Prentice Hall, Singapore.
2. De Bono, E. (2003). *Serious Creativity 1: Lateral Thinking Tools, Techniques and Application*. Allscript Books, Singapore.
3. De Bono, E. (2003). *Serious Creativity 2: Lateral Thinking Tools, Techniques and Application*. Allscript Books, Singapore.
4. Ceserani, J. & Greatwood, P. (1995). *Innovation and Creativity*. Kogan Page, London.
5. Ceserani, J. & Greatwood, P. (2001). *Innovation and Creativity*. Creast Publishing House, New Delhi.

BEF 22903 ENGINEERING ELECTROMAGNETICS

SYNOPSIS:

Explanation on electromagnet; Explanation on vector analysis, Electromagnetism, Electrostatic; Charge, Charge density, Coulomb's Law, Flux density, Potential difference, Gauss's law, Electrical energy, Capacitance, Magnetostatic, Biot-Savart's law, Ampere's Circuit law, Magnetic force, Magnetic material, Magnetic circuit, Induction, Transformer, Time-Varying fields; Faraday's law, Lenz's law, Maxwell equations, Electromagnetic wave equations: Polarization, Acceleration, Frequency, Power, Wave reflection at normal incidence plane and oblique plane.

REFERENCES:

1. Matthew M.O.Sadiku, *Element of Electromagnetic*, 3rd Edition, Oxford University Press, 2001 (Repr. 2003).
2. Fawwaz T. Ulaby, *Fundamentals of Applied Electromagnetics*, Prentice Hall, 2004.
3. Fawwaz T. Ulaby, *Electromagnetics for Engineers*, Pearson Education, 2005.
4. William H. H, *Engineering Electromagnetics*, McGraw-Hill, NY, 2005.

5. Edward J. Rothwell and Michael J. Cloud, *Electromagnetics*, CRC Press, 2001.
6. Zoya Popovic and Branko D. Popovic, *Introductory Electromagnetics*, Prentice Hall, New Jersey, 1999.

BEF 23803 POLYPHASE CIRCUIT ANALYSIS

SYNOPSIS:

This subject is about in electric circuits analysis are the fundamental for single phase and three phase system. By understanding the technique of complex power, transfer power and power factor the ability of AC system can be determine. After the students know the basic technique, the advanced methods like introduction to p.u will be introduced to the student for the real three phase electrical network. By knowing the basic equivalent circuit and formulas of generator, transformer and transmission lines the students will be able to develop the Y bus or Z bus matrices for power system analysis study especially for the power flow studies. The symmetrical and unsymmetrical components will be explain to the students such as to find the positive, negative and zero sequence in preparing the student for fault studies

REFERENCES:

1. James W. Nilson, Susan A. Riedel., *Electric Circuits*, 7th Edition, Addison Wesley, 2006.
2. H. Hayt, Jr., Jack E. Kemmerly, Steven M. Durbin, *Engineering Circuit Analysis*, 7th Edition, McGraw Hill, 2007
3. Theodore Wildi, *Electrical Machines, Drives and Power Systems*, Prentice Hall, 2006.
4. Chapman Stephen J, *Electric Machinery and Power System Fundamentals*, McGraw-Hill, 2002.
5. Hadi Saadat, *Power System Analysis*, 2nd Edition, Prentice Hall, 2004.
6. Timothy L. S, William E. D., *Electrical Power and Controls*, 2nd Edition, Prentice Hall, 2004.
7. Duncan Glover, Mulukutla S. Sarma, *Power System Analysis and Design*, 3rd Edition, J Brooks/ Cole Thomson Learning, 2002.

BEF 23401

ELECTRICAL ENGINEERING LABORATORY I

SYNOPSIS:

The purpose of this subject is to introduce the students with the basic concepts of electrical and electronic engineering and to expose the students towards the analysis of electrical and electronic circuits. Define and differentiate the fundamental of electrical and electronic circuits and laws. The general form solutions were also introduce for the first order, second order circuits, three phase system, two port network. Finally, some computer tools also introduces; Pspice and Matlab

REFERENCES:

1. Alexander & Sadiku, Fundamentals of Electric Circuits, 3rd Edition, McGraw Hill, 2007.
2. Floyd, Thomas L, Electrical Circuits Fundamentals, NJ Pearson, 2007.
3. Boylestad, Introductory Circuit Analysis, 11th Edition, NJ Pearson, 2007.
4. James W.Nilsson, Susan A.Riedel, Electric Circuits, 7th Edition, Upper Sadle River, NJ Pearson, 2005.
5. James W. Nilson, Susan A. Riedel., Electric Circuits, 7th Edition, Addison Wesley, 2006.

YEAR 2

SEMESTER 2

BWM 30602 ENGINEERING MATHEMATICS IV

SYNOPSIS:

Solution of nonlinear equations: Bisection, secant, and Newton Raphson method. Solution of linear systems of equations: Gaussian elimination, LU decomposition, Thomas, and Gauss-Seidel method. Interpolation and polynomial approximation: Newton's divided-difference, Lagrange and cubic spline. Numerical Differentiation: Taylor series expansion. Numerical Integration: Simpson and Gauss quadrature method. Eigen Values: Power method. Ordinary Differentiation Equations: Solution of Initial-Value Problems by Taylor Series, Euler, Huen, Runge-Kutta methods. Solution of Boundary-Value Problems by finite difference method. Partial Differentiation Equations: Explicit and implicit method using finite difference method. Finite-element Method: Finite-element application in one dimension heat flow.

REFERENCES:

1. Nafisah Md Kamaruddin, *et. al.* 2008. *Numerical Method*.
2. D. V. Griffiths, I. M. Smith. 2006. *Numerical methods for engineers*, 2th Edition. Boca Raton, FL: Chapman & Hall.
3. J. N. Sharma. 2004. *Numerical methods for engineers and scientists*, Pangbourne: Alpha Science International.
4. Jaan Kiusalaas. 2005. *Numerical methods in engineering with MATLAB*, Cambridge: Cambridge University Press.
5. John H. Mathews, Kurtis D. Fink. 2004. *Numerical methods using MATLAB*, 4th Edition. US Upper Saddle River, NJ: Pearson Education.

BEE 10202 ENGINEERS AND SOCIETY

SYNOPSIS:

This course concerns with the profession of engineers, engineers' role and professional bodies governing the profession. Relationship of engineering and organization, and society at large are covered in this course. Ethics and professionalism cover the code of ethics and moral reasoning. Emphasis is given to the ethical issues in engineering practice; also intellectual property and anti-corruption concept. Next are the responsibilities of engineers and their rights at workplace and team work. Commitment in providing service is taught which involves

safety, environmental and global issues. Last are the engineering acts, regulations and standard.

REFERENCES:

1. Mike W. Martin, Ethics in Engineering, 4th. Ed. McGraw Hill, 2005
2. Roland Schinzinger and Mike W. Martin, Introduction to Engineering Ethics, McGraw Hill, 2000.
3. Charles B. Fleddermann, Engineering Ethics, 2nd Edition, Prentice Hall 2004
4. John D. Kemper and Billy R. Sanders, Engineers and Their Profession, 5th Ed. Oxford University Press, 2001
5. Daniel A. Vallerio, P. Aarne Vesilind, Socially Responsible Engineering : Justice in Risk Management, John Wiley, 2006

BEF 22803 TRANSFORM CIRCUIT ANALYSIS

SYNOPSIS:

This course provides further study in the analysis of linear circuits using advanced mathematics. Topics include mathematical representation and operations on signal waveforms, phasor circuit analysis, time domain circuit analysis using the convolution integral, transient and steady-state analysis of circuits using Laplace transform, steady-state analysis of circuits using Fourier series, transient and steady-state analysis of circuits using Fourier transform, and state-variable method of circuit analysis.

REFERENCES:

1. Hart W A, Kemmerly J E, Durbin S M, Engineering Circuit Analysis, McGraw-Hill 2002.
2. DeCarlo R A, Pen-Min Lin, Linear Circuit Analysis, Prentice Hall, 2002.
3. Irwin J D, Basic Engineering Circuit Analysis, MacMillan Publishing Co. 2002.
4. Alexander & Sadiku, Fundamentals of Electric Circuits, 3rd Edition, McGraw Hill, 2007.
5. Floyd, Thomas L, Upper Sadle River, Electrical Circuits Fundamentals, NJ Pearson, 2007.

BEF 23903 ELECTRICAL MEASUREMENTS

SYNOPSIS:

There are many classifications of measurement instruments for electrical quantities. This subject is developed to train the student about the principles of correct measurement. Many types of measurements parameters will be used such as voltage, current, frequency, phases, power, modulation, resistance, capacitance, Q, and resonance frequency. Besides, the electrical measurements instruments such as generators, oscilloscope, digital multimeter and power meter will be used to improve the student's knowledge about electrical measurement.

REFERENCES:

1. Steven Geczy, Basic Electrical Measurements, Prentice Hall, 2005.
2. Paul B. Zbar, Gordon Rockmaker, David J. Bates Basic Electricity - A Text Lab Manual, McGraw-Hill, 2002.
3. Eiji Mikawa, Fundamental Electrical Engineering, Yokogawa Electric Corporation.
4. R. A. Witte, Electronic Test Instruments: Analog and Digital Measurements, 2nd Ed., 2002, Prentice-Hall.
5. L. D. Jones and F. A. Chin, Electronic Instruments and Measurements, Prentice-Hall. 1991.
6. Ian Hickman, Oscilloscopes: How to use them, how they work, 5th ed.; Newnes, 2001.
7. Glen A. Mazur, Digital Multimeter Principles; American Technical Publishers, Inc.; 2000.

BEF 24103 ELECTRICAL MACHINES

SYNOPSIS:

This subject is arranged to give the students a strong understanding of the fundamentals and applications of electromechanical devices, namely transformers and electrical machines. Generally, electrical machine has two main functions, i.e. it could be act as a generator or as a motor. Among the contents of the syllabus are fundamentals of machinery principles, three phase circuits, transformers, AC and DC machines.

REFERENCES:

1. Teaching Module: Electric Machines and Drives; UTHM, 2007.
2. Chapman Stephen J., Electric Machinery Fundamentals, 4th Edition; McGraw-Hill, 2005.
3. Theodore Wildi, Electrical Machines, Drives and Power Systems; Prentice Hall, 2006.
4. P.C. Sen, Principles of Electric Machines and Power Electronics, 2nd Edition; John Wiley & Sons, 1997.
5. Mohamed A. E., Fundamentals of Electric Drives; Brooks/Cole Publishing, 2000.
6. Ion Boldea and S.A. Nasar, Electric Drives, 2nd Edition; Taylor & Francis, 2006.

BEF 24002 ELECTRONIC INSTRUMENTS AND MEASUREMENTS

SYNOPSIS:

The topics are studied theoretically and experimentally in a lecture cum laboratory environment. The lectures expound the operating principles of common electronic measuring instruments and the instrumental techniques of measuring electrical quantities. The laboratory works provide practical experience in the use of basic electronic instruments such as digital multimeters, signal generators, electronic bridges and oscilloscopes.

REFERENCES:

1. Jones L D, Chin A F, Electronic Instruments and Measurements, Prentice-Hall, 1995.
2. Steven Geczy, Basic Electrical Measurements, Prentice Hall, 2002.
3. R. A. Witte, Electronic Test Instruments: Analog and Digital Measurements, 2dn Ed., Prentice-Hall, 2002.
4. D. Jones and F. A. Chin, Electronic Instruments and Measurements, Prentice-Hall, Prentice-Hall.
5. H S Kalsi, Electronic Instrumentation, 2nd Edition, McGraw Hill, 2004.

BEF 24201

ELECTRICAL ENGINEERING LABORATORY II

SYNOPSIS:

This subject is arranged to give the students approaches regarding the laboratory works in electric machines. Among the contents of the syllabus are the methods of handling and techniques of analysing the transformers, synchronous machines, and induction motor. Examples of experiments are no-load and short circuit tests for transformers, no-load and full-load tests for synchronous generators, characteristic test of induction motor and parallel operation test of synchronous generators.

REFERENCES:

1. Teaching Module: Electric Machines and Drives (1st Edition); UTHM, 2007.
2. Chapman Stephen J., Electric Machinery Fundamentals (4th Edition); McGraw-Hill, 2005.
3. Theodore Wildi, Electrical Machines, Drives and Power Systems; Prentice Hall, 2006.
4. P.C. Sen, Principles of Electric Machines and Power Electronics, 2nd Edition; John Wiley & Sons, 1997.
5. Mohamed A. E., Fundamentals of Electric Drives; Brooks/Cole Publishing, 2000.
6. Ion Boldea and S.A. Nasar, Electric Drives, 2nd Edition; Taylor & Francis, 2006.
7. Electronic Machines, Drives and Power Systems, 5th Edition, Theodeo Wildi, Prentice Hall, 2002.

YEAR 3

YEAR 3

SEMESTER 1

BEF 32703 ELECTRONICS FOR MEASUREMENT AND CONTROL

SYNOPSIS:

This subject is arranged to furnish students with the understanding of the versatile operational amplifier and other solid state switches. It starts with the realization of various types of amplifier circuits with specific gains. The operational amplifier can also be made to generate various forms of waveform and can be turned into timer, VCO, and PLL. The usage of opamp in interfacing with sensors greatly reduces the drudgery of circuitry and enhancing linearity of output signal. Towards the end, applications of opamp in measurement circuitry as well as simple control are exhibited.

REFERENCES:

1. Thomas L Floyd, Electronic Devices, Conventional Current Version, 8th Edition, Pearson International Edition, 2008.
2. C S Rangan, G R Sarma, V S V Mani, Instrumentation, Devices & Systems, 2nd Edition Tata McGraw Hill, New Delhi, 1997
3. H S Kalsi, Electronic Instrumentation, 2nd Edition, McGraw Hill, 2004.
4. John P Bentley, Principles of Measurement Systems, 4th Edition, Pearson, 2005.
5. Ali Aminian, Marian Kazimierczuk, Electronic Devices, A Design Approach, Pearson International Edition, 2004

BEF 33003 ELECTRICAL CONTROL SYSTEM

SYNOPSIS:

This subject is about the analysis and design of control systems. The subject is organized in six chapters. Chapter 1 presents an introduction to control systems. Chapter 2 provides introduction to Laplace transforms, transfer function, and mathematical modeling of dynamic systems (mechanical, electrical, and electronic system). Chapter 3 presents time domain analysis of control systems. Chapter 4 treats root locus method to analyze control systems. Chapter 5 presents basic materials on frequency domain analysis of control systems. Finally, Chapter 6 deals with the introduction to control system design including the design of PID controllers and compensators.

REFERENCES:

1. Nise, N. S., Control Systems Engineering, 4th Ed., John Wiley, 2004.
2. Dorf, R. C., Bishop R. H., Modern Control Systems, 10th Ed., Prentice Hall, 2005
3. Ogata, K., Modern Control Engineering, 4th Ed., Prentice Hall, 2002.
4. Kuo, B. C., Golnaraghi, F., Automatic Control System, 8th Ed., John Wiley, 2003
5. Gopal, M., Control Systems: Principle and Design, 2nd Ed., McGraw-Hill, 2002

BEF 34303 ELECTRIC POWER GENERATION

SYNOPSIS:

The subject deals with the topics related to the types of electricity power generation, the evolution of electricity generation and their relationship with modern electric power system. First, the thermal electric system with difference energy sources including coal-fired power plant, gas turbine and combine cycle power plant, and piston engine power plant are discussed. The renewable electric system with difference energy sources such as hydro, solar, wind, geothermal, biomass, ocean and tidal power are also included. Finally the nuclear electric system with fission and fusion concepts is discussed in this subject.

REFERENCES:

1. Paul Breeze, Power Generation Technologies, Elsevier, 2005.
2. Theodore Wildi, Electrical Machines, Drives and Power Systems, Prentice Hall, 2006.
3. Chapman Stephen J., Electric Machinery and Power System Fundamentals, McGraw-Hill, 2002.
4. Mohamed E. El-Hawary, Electrical Energy System, 2nd Ed., Taylor & Francis, 2007.
5. Marcelo Godoy Somoos, Alternative Energy System, Taylor & Francis, 2007.

BEF 34403 ELECTRIC MOTOR DRIVES

SYNOPSIS:

Electrical motor drives are important equipments in the various activities in the industrial sectors. Principally, they are used as a means of running the various industrial machines. This subject is developed to give the required knowledge regarding to the starting, selection, sizing and the torque estimation of the electrical motor drives. In addition the operational aspect and the industrial application of the electric motor drives are being describe. Analysis of the various circuit configurations of the braking techniques will also be discussed.

REFERENCES:

1. B.R. Sharma, Satya Prakashan, Utilisation of Electrical Energy, Prentice Hall, 2003.
2. Theodore Wildi, Electrical Machines, Drives and Power Systems, Prentice Hall, 2006.
3. Chapman Stephen J., Electric Machinery and Power System Fundamentals, McGraw-Hill, 2002.
4. Timothy L. S, William E. D., Electrical Power and Controls, 2nd Edition, Prentice Hall, 2004.
5. Mohamed E. El-Hawary, Principles of Electric Machines with Power Electronic Applications, 2nd edition., Wiley Interscience, 2002.
6. Charles I. Hubert, Electric Machines, 2nd Edition, Prentice Hall, 2002.

BEF 34503 POWER ELECTRONICS

SYNOPSIS:

This subject discusses about the types of solid state switching components, the working of various types of converter circuits and the associated control circuits. It also touches on the principles of AC and DC motor speed control. The use of solid state components in handling high voltage DC is also dealt with. Lastly the applications of switching devices and examples in industry are being discussed.

REFERENCES:

1. V.R. Moorthi, Power Electronics Devices, Circuits and Industrial Applications, Oxford University Press, 2005.
2. E. Acha, V.G. Agelidis, O. Anaya Lara & T.J.E Miller, Power Electronic Control in Electrical System, Newnes, 2002.

3. Ned Mohan, William P. Robbins & Tore M. Undeland, Power Electronics: Converters, Applications and Design, John Wiley, 2003.
4. Muhammad H. Rashid, Power Electronics: Circuits, Devices, and Applications, Prentice Hall, 2004.
5. Theodeo Wildi, Electric Machines, Drives and Power Systems, 5th Edition, Prentice Hall, 2002.

BEF 34702 POWER ENGINEERING LABORATORY I

SYNOPSIS:

The demand for control of electric power for electric motor drives system and industrial controls existed for many years. Power electronics combine power, electronics and control and defined as the applications of solid-state electronics for the control and conversion of electric power. This subject is developed to give better understanding of control circuit and components consist in it. Besides, student can get opportunity to control ac induction motor by using industrial inverter manually or connecting with PC and PLC.

REFERENCES:

1. Timothy L. S, William E. D., Electrical Power and Controls, 2nd Edition; Prentice Hall, 2004.
2. Muhammad H. Rashid, Power Electronic Circuit, Devices and Applications, 3rd Edition; Prentice Hall, 2004.
3. E.Acha, V.G Agelidis, O. Anaya-Lara, T.J.E Millwer, Power Electronics Control in Electrical System Newnes, 2002
4. V.R. Moorthi, Power Electronics Devices, Circuits, and Industrial Applications, Oxford University Press, 2005
5. Ned Mohan, William P. Robbins, Tore M. Undeland, Power electronics : Converters, Applications and Design, John Wiley, 2003

YEAR 3

SEMESTER 2

BPK30902 ENGINEERING ECONOMICS

SYNOPSIS:

Ekonomi kejuruteraan merupakan satu bidang kajian yang mengaitkan beberapa aspek ekonomi semasa membuat keputusan kejuruteraan. Aspek tersebut melibatkan penilaian kos dan faedah bagi projek teknikal yang dicadangkan. Konsep asas yang digunakan ialah nilai wang-masa, dan teknik yang berkaitan dengan pengkompaunan, pendiskaunan, dan konsep kesetaraan. Beberapa kaedah digunakan untuk menentukan sama ada sesuatu pelaburan itu menguntungkan atau tidak iaitu kaedah PW, FW, AW, IRR dan kaedah faedah-kos.

REFERENCES:

1. Blank, L.T., A. Tarquin (2008): *Basics of Engineering Economy*, International ed., McGraw-Hill, New York,
2. Mohamad Sirin, R. (2007): *Teori Asas Ekonomi Kejuruteraan*, Cetakan Awal, Fakulti Pengurusan Teknologi, KUiTTHO. Malaysia.
3. Sullivan W.G, Wicks E.M. & Luxhoj J.T, (2006). *Engineering Economy*, 13th Edition, Prentice Hall Inc.
4. Chan S. Park, (2007). *Contemporary Engineering Economics*, 4th Edition, Pearson International Edition.

BEB 31803 ELECTRONIC COMMUNICATION SYSTEMS

SYNOPSIS:

This subject introduces the fundamentals in analog and digital communication systems. Comprises of analysis of signals and noise, generation of analog and digital modulation schemes, transmission lines, antenna and wave propagation as a part of a complete system in communication. Finally, the topic discussed relate with current application in communication systems.

REFERENCES:

1. Wayne Tomasi, *Electronic Communication Systems: Fundamental Through Advanced* 5th Ed., Pearson Prentice Hall, 2004.
2. Jeffrey S. Beasley, Gary M. Miller, *Modern Electronic Communication* 9th Ed., Pearson Prentice Hall 2008.

3. Proakis, J. G., Salehi M., Communication System Engineering 2nd Ed, Pearson Prentice-Hall, 2002.
4. Couch, L. W., Digital and Analog Communication Systems, 7th Ed, Pearson Prentice-Hall, 2007.
5. Proakis, J. G. et al, Essential of Communication System Engineering, Pearson Prentice-Hall, 2005.
6. Simon Haykin, Communication System, 4th Ed, John Wiley and Sons

BEF 33103 ELECTRONIC DRIVES AND APPLICATIONS

SYNOPSIS:

This subject deals with the fundamental of electronics drives and its applications in industries. It begin with the components involve in electric drives the way to chose the correct drives system. The various power electronics converters and the control schemes are also covered. Modern traction, solar and battery drives in electrical drives are delivered considering current and future needs of the industry. Lastly, the digital control implementation for electric drives system is taught in general.

REFERENCES:

1. GK Dubey, Fundamental of Electrical Drives, 2nd Edition, Alpha Science Int. Ltd. 2001.
2. T. Wildi, Electrical Machines, Drives, and Power Systems, Prentice Hall, 2006.
3. B.K. Bose, Modern Power Electronics and AC Drives, Prentice Hall, 2002.
4. W. Leonhard, Control of Electrical Drives, Springer, 2001.
5. M.H. Rashid, Power Electronics: Circuits, Devices, and Applications, Prentice Hall 2004
6. Slobodan N. Vukosavic, Digital Control of Electrical Drives, , Springer, 2007.

BEF 33203 UTILISATION OF ELECTRICAL ENERGY

SYNOPSIS:

This subject is arranged to furnish students understanding of the utilisation of electrical energy in industrial applications. Electrical energy that supplied to its users is either generated from the conventional generation plants or the renewable systems. The electrical energy is utilised in various sectors such as industry, commercial, agriculture, mining, and public utilities like street lighting. Generally, about half of the generated energy in Malaysia is utilised by industrial sectors. HVAC

(Heat, Ventilation, and Air Conditioning) consumes most of the electrical energy that supplied to industry. Thus, it is vital for an electrical engineer to know how the electrical energy is utilised in the industrial sector as well as concerns of the technical issues that follows.

REFERENCES:

1. Theodore Wildi. Electrical Machines, Drives, and Power Systems, 6th Edition, Pearson Education International, 2006.
2. King Alexander C & Knight William. Uninterruptible Power Supplies and Standby Power Systems, McGraw-Hill, 2003.
3. Dugan Roger C, McGranaghan M F, Santoso S and Beaty H Wayne. Electrical Power Systems Quality, 2nd Edition, McGraw-Hill, 2003.
4. R.B. Theodore. Electrical Systems Design, Prentice Hall, 2003.
5. T.A. Short. Electric Power Distribution Equipment and Systems, Taylor & Francis Group, 2006.
6. A. Emadi, A, Nasiri, and S.B. Bekiarov. Uninterruptible Power Supplies and Active Filters, CRC Press, 2005.

BEF 34603 ELECTRIC POWER TRANSMISSION AND DISTRIBUTION

SYNOPSIS:

The subject aims to provide knowledge and comprehension on power engineering. Emphasis is given to basic power transmission theory and power distribution. Among the topic covered are elements of transmission and distribution, type of conductors, type of insulator, constants of transmission line, type of transmission line and power factor improvement. Besides, the ac distribution and cables are also introduced in this syllabus.

REFERENCES:

1. Sharma B.R, Transmission and Distribution of Electrical Power, New Delhi Satya Prakashan, 2000.
2. Pansini, Anthony J, Taylor and Francis, Power Transmission and Distribution, 2005.
3. Leonard L.Grigby, Boca Raton Taylor and Francis, Electric Power Generations, Transmission and Distribution, 2007.
4. As Pabla, Electric Power Distribution, New York McGraw-Hill, 2005.
5. Hadi Saadat, Power System Analysis, Boston McGraw-Hill 1999.
6. J. Duncan Glover and Mulukutla S. Sarma, Power System Analysis and Design (3rd Edition), Brooks/ Cole Thomson Learning, 2002.

BEF 35002 POWER ENGINEERING LABORATORY II

SYNOPSIS:

This subject is arranged to teach students the practical aspects of power quality measurement and monitoring. Among the contents of the syllabus are the methods of handling power quality analyzers and techniques of analysing the dips, swells, transients, harmonics and voltage unbalance. Low-voltage switchboard components, operation and maintenance are also introduced. Examples of experiments are measurements of harmonics and calculation of total harmonic distortion, low-voltage switchboard operation and maintenance, and test on air circuit breaker and moulded case circuit breaker.

REFERENCES:

1. Shoaib Khan, Industrial Power Systems. CRC Press, 2008.
2. Ali Emadi, Energy-efficient Electric Motors, 3rd. Edition, Marcel Dekker, 2005.
3. R.B. Theodore. Electrical Systems Design, Prentice Hall, 2003.
4. T.A. Short, Electric Power Distribution Equipment and Systems, Taylor & Francis Group, 2006.
5. T.A. Short, Electric Power Distribution Handbook, CRC Press, 2004.
6. Barry W. Kennedy, Power Quality Primer, McGraw-Hill, 2000.
7. Roger C. Dugan, Mark F. McGranaghan, H. Wayne Beaty, Electrical Power Systems Quality, McGraw- Hill, 2000.

YEAR 3

SEMESTER 3

BEE 30304 INDUSTRIAL TRAINING (8 WEEKS)

SYNOPSIS

Students are required to undergo industrial training in related field for 8 weeks in the organizations determined by faculty and assessed by both their external and internal supervisors.

REFERENCES:

1. Buku Log Latihan Industri UTHM. (Bahagian A), Pejabat Penerbit UTHM

YEAR 4

YEAR 4

SEMESTER 1

BEE 40602 FINAL YEAR PROJECT I

SYNOPSIS:

This course is the first part of an individual project during final year of study based on a topic selected from the subjects studied or a related engineering problem. Each student is expected to present his proposal and research plus a progress report during the first seminar of the final year project.

REFERENCES:

1. Guidelines for the Implementation of Final Year Project in the Faculty of Electrical and Electronics Engineering UTHM.
2. Guidelines for Thesis Writing.

BWM 20502 ENGINEERING STATISTICS

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 , chi-square and F distribution. Estimation : Point estimate, confidence interval for single mean, difference between two means, single variance and ratio of two variances. Hypothesis Test : Type 1 and type 2 errors, hypothesis test for single mean, difference between two means, single variance and ratio of two variances. Simple Linear Regression : Graphical method, simple linear regression model, least square method, hypothesis testing for intercept and slope, coefficient of determination, correlation coefficient.

REFERENCES:

1. Norziha Che Him et al. First Edition. Engineering Statistics (BSM 2922) Pusat Pengajian Sains, UTHM 2009.
2. Nafisah @ Kamariah et. al. Second Edition. Engineering Statistics. Pusat Pengajian Sains, KUiTTHO. 2004.
3. Quek Suan Goen, Leng Ka Man & Yong Ping Kiang. Mathematics STPM. Federal Publications, Selangor. 2004.
4. John E. Freund. Mathematical Statistics. Sixth Edition. Prentice-Hall, New Jersey. 1999.
5. Robert D. Mason. Statistics : An Introduction. Sounders College Publisher, Texas. 1994.

BEE 30103 ENGINEERING MANAGEMENT

SYNOPSIS

This course introduces engineers to the ways in which management principles are applied in engineering project and organization. Managing people and career opportunities as engineering manager. Management function: planning and forecasting, strategy formulation, decision making, organizing, leading and controlling. Quality Management. Project management and its activities. Resources Management, Financial Management, and Maintenance, Reliability and Safety Management are among the topics covered.

REFERENCES:

1. Lucy C. Morse and Daniel L Babcock, Managing Engineering and Technology. Prentice Hall, 2007.
2. C. M. Chang, Engineering Management : Challenges in the New Millennium, Prentice Hall, 2005
3. Avraham Shtub, Jonathan F. Bard, Shlomo Globerson, Project Management : Processes, Methodologies and Economics, Prentice Hall, 2005
4. John V. Chelsom, Andrew C. Payne, Management for Engineers, Scientists and Technologists, John Wiley, 2004
5. Abdul Talib Bon, Pengurusan Kejuruteraan, Penerbit KUiTTHO, 2004.

BEF 43303 POWER SYSTEM ANALYSIS AND PROTECTION

SYNOPSIS:

This subject is arranged to provide students understanding of the electric power system analysis and the protection schemes. Power system analysis is important in order to analyse power system network in large or small scales by considering several critical parameters. Besides that, protection schemes are compulsory to ensure the power system network is safe and strictly follow all safety and technical standards

REFERENCES:

1. Hadi Saadat, Power System Analysis (2th Edition), McGraw-Hill, 2004.
2. Badri Ram & D N Vishwakarma, Power System Protection And Switchgear, Tata McGraw-Hill, 2005.
3. Arthur R. Bergen & Vijay Vittal, Power Systems Analysis (2th Edition), Pearson Prentice Hall, 2000.
4. John J. Grainger & William D. Stevenson, Power System Analysis. McGraw-Hill, 2004.
5. Stephen J. Chapman, Electric Machinery and Power System Fundamentals, McGraw-Hill, 2002

BEF 44903 INDUSTRIAL POWER SYSTEMS

SYNOPSIS:

Industrial Power Systems is a must-have subject for anyone involved in power engineering, especially in the design and maintenance of power distribution systems. This subject is arranged to furnish students understanding of the utilisation of electrical energy in industrial applications. The industrial power distribution system generally represents a relatively small portion of the entire plant cost (5% to 10%), yet the production and output of the other 90% to 95% of plant investment is dependent on the service delivered by that investment in the power distribution system. Thus, it is vital for a power engineer to know the features and design procedures of industrial power systems, including power system studies, load estimation, grounding, instrument transformers, protective devices, power cables, application of capacitors, and energy-efficient induction motor and its protection procedures.

REFERENCES:

1. Shoaib Khan. Industrial Power Systems. CRC Press, 2008.
2. Ali Emadi. Energy-efficient Electric Motors, 3rd. Edition, Marcel Dekker, 2005.
3. R.B. Theodore. Electrical Systems Design, Prentice Hall, 2003.
4. T.A. Short. Electric Power Distribution Equipment and Systems, Taylor & Francis Group, 2006.
5. T.A. Short. Electric Power Distribution Handbook, CRC Press, 2004.

BEF 45102 POWER ENGINEERING LABORATORY III

SYNOPSIS:

The three phase network is a basic understanding of the power system topology. The power system can be separated into 4 stages that are the generator, transformer, transmission lines and distribution components. In each stage it has its own technique to analyse the characteristics of the system. For the generator the concept of power transfer from the generator will be learned while in the transformer the open and short circuit test will be conducted with a balanced load being attached to the system. The effect of medium and long transmission line with Tee or Pi module will also be investigated with the balanced and unbalanced load applied to the network. In the distribution system the performance of protection equipments and reactive power compensation will be demonstrated in demonstrating the effect of the fault components to the distribution network.

REFERENCES:

1. James W. Nilson, Electric Circuits, 7th Edition, Addison Wesley, 2004.
2. Theodore Wildi, Electrical Machines, Drives and Power Systems, Prentice Hall, 2006.
3. Chapman Stephen J., Electric Machinery and Power System Fundamentals, McGraw-Hill, 2002.
4. Hadi Saadat, Power System Analysis, 2nd Edition, Prentice Hall, 2004.
5. John J. Grainger, William D. Stevenson, Power System Analysis, McGraw Hill, 1994.
6. Timothy L. S, William E. D., Electrical Power and Controls, 2nd Edition, Prentice Hall, 2004.
7. J. Duncan Glover and Mulukutla S. Sarma, Power System Analysis and Design, 3rd Edition) Brooks/ Cole Thomson Learning, 2002.

YEAR 4

SEMESTER 2

UWB10802 FRENCH LANGUAGE

SYNOPSIS:

This course is designed for students to learn the basic of French 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 French language.

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.

UWB10902 GERMAN LANGUAGE

SYNOPSIS:

This course is designed for students to learn the basic 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, (2010). *Guten Tag !*, Pejabat Penerbit UTHM.
2. Angela Wilkes. (2006). *GERMAN FOR BEGINNERS*, London: Usborne Publishing Ltd.
3. Aufderstrasse. (1998). *Themen Neu 1*, Lehrwerk fuer Deutsch als Fremdsprache.

4. Dr. Albert H. Small. (1991). German à la Cartoon. German Grammar through Cartoons.
5. Oxford University Press (2006). First Edition 2006- Oxford Beginner's German Dictionary.

UWB11002 JAPANESE LANGUAGE

SYNOPSIS:

This course is designed for students to learn the basic Japanese 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 Japanese language.

REFERENCES:

1. Surie Network, (1998): *Minna no Nihongo* – Main text book, First Publish. 3A Corporation Tokyo.
2. Surie, Network (2000): *Minna no Nihongo – Hyōjunmondaishyū*, First Publish. 3A Corporation Tokyo.
3. Surie Network, (2009): *Minna no Nihongo* – Translation and Grammatical Notes in English (Asian Edition), Eighth Edition. 3A Corporation Tokyo.
4. The AOTS, (1977): *Shin Nihongo no Kiso* – Japanese Kana Workbook, First Publish: 3A Corporation Tokyo.

UWB11102 MANDARIN LANGUAGE

SYNOPSIS:

This course is designed for students to learn 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 exposed to the real daily situations which will help them to communicate using Mandarin Language.

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.

UWB11202 BAHASA MELAYU

SYNOPSIS:

This course is designed for students to learn the basic of Bahasa Melayu. 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 Bahasa Melayu.

REFERENCES:

1. Asmah Hj. Omar. (2005). Susur Galur Bahasa Melayu. DBP : KL
2. Asmah Hj. Omar. (2003). Nahu Melayu Mutakhir. DBP : KL
3. Abdul Hamid Mahmood. (1992). Menguasai Ejaan Bahasa Malaysia Dengan Cepat. DBP: KL
4. Abdul Hamid Mahmood. (1998). Menguasai Ejaan Bahasa Melayu. DBP : KL
5. Edward S. King. (1998). Speak In Malay. Times Publication : KL

UWB11302 SPANISH LANGUAGE

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.

UWB11402 ARABIC LANGUAGE

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 KUiTTTHO.
3. Ab. Halim Mohammed; Rabiyyah 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-Saudiyah: Idarah al-Kutub al-Madrasiyyah, Wizarah al-Taalim.

BEE40704 FINAL YEAR PROJECT II

SYNOPSIS:

This course is the second part of an individual project during final year of study based on a topic selected from the subjects studied or a related engineering problem. Each student is expected to present result of his final year project.

REFERENCES:

1. Guidelines for the Implementation of Final Year Project in the Faculty of Electrical and Electronics Engineering UTHM.
2. Guidelines for Thesis Writing.

BEF 45203 HIGH VOLTAGE ENGINEERING

SYNOPSIS:

The demand for the generation and transmission of large amount of electric power today, necessitates in transmission at extra-high voltages. At this juncture, a practising electrical engineer or a student of electrical engineering is expected to possess knowledge of techniques and should have sufficient background in high voltage engineering. This subject provides all the information on insulating materials, breakdown phenomena, overvoltages and testing techniques. Generation and measurements of various kinds of high voltages are also introduced

REFERENCES:

1. M. S. Naidu & V. Kamaraju, High Voltage Engineering, McGraw-Hill, 2004.
2. E. Kuffel, W. S. Zaengl & J. Kuffel, High Voltage Engineering: Fundamentals, Newnes, 2000.
3. D. Kind, High Voltage Test Tehniques, Newnes, 2001.
4. M. Abdel-Salem, H. Anis, A. El-Morshedy and R. Radwan, High Voltage Engineering: Theory and Practice, Marcel Dekker, 2000.
5. Stephen A. Jay, High Voltage Electricity Installations: A Planning Perspective, Hoboken, NJ, John Wiley, 2006

BEF 45303 ELECTRICAL SYSTEMS DESIGN

SYNOPSIS:

Electrical system design is the most important topic which will be discussed in this subject. This subject covers methods of wiring, schemes of distribution and protection for lighting and power installations for buildings of all types. Other electrical systems such as fire alarms, call systems, lifts, standby supplies and lightning protection are also covered. For each, the methods of design are described in detail, with examples of calculations. The chapter on lightning protection has been revised to confirm to the latest standards and a section on uninterruptible power supplies has been added. This subject will provide a sound understanding of the design principles used to design electrical circuits in accordance with the applicable national safety.

REFERENCES:

1. R.B. Theodore. Electrical Systems Design, Prentice Hall, 2003.
2. Short Course on Electrical Installations for Building; Chong W C, Ngan Ann Polytechnic, Singapore, 1991.
3. Handbook of Electrical Design Details; John E, USA: McGraw-Hill Professional Publishing, 2003.
4. Kertas Kerja Kursus: Rekabentuk Sistem Bekalan Kuasa Elektrik: Duha Engineering Services, 2007.
5. Hadi Saadat, Power System Analysis, 2nd Edition, Prentice Hall, 2004.

BEF 45401 POWER ENGINEERING LABORATORY IV

SYNOPSIS:

The subject and is developed to give the required knowledge regarding electrical wiring and installation also the understanding of the operational aspect of the low voltage switchboard. It will develop the capability of carrying out electrical wiring activities up to a certain level of competency. The topics covered are the domestic wiring and installation, industrial wiring and installation, site setup, cabling, protection relay calibration, testing and commissioning of the low voltage switchboard and also the performance testing of protective devices in a low voltage system.

REFERENCES:

1. Abd. Samad Hanif, Pemasangan dan Penyenggaraan Elektrik, DBP, 2004.
2. IEE on-site Guide Including Amendment 1 To BS 7671:1992, IEE, 1995.
3. Ir. C.L.Chin, Low Voltage Switchboard Training Document, 2007
4. Ir. C.L. Chin, Secondary Current Injection Test Set (SCITS) Training Document, 2007.
5. Ali Aminian, Marian Kazimierczuk, Electronic Principles, Pearson Prentice Hall, 2004.

BEF 44803 POWER QUALITY

SYNOPSIS:

This subject introduces power quality issues and problems as they relate to electric power transmission and distribution systems. This course will provide students with overall understanding of the power quality problems and how they interact with the system. In addition, possible measures to solve the power quality problems will also be discussed in this course.

REFERENCES:

1. Barry W. Kennedy, Power Quality Primer, McGraw-Hill, 2000
2. Roger C. Dugan, Mark F. McGranaghan, H. Wayne Beaty, Electrical Power Systems Quality, McGraw- Hill, 2000