INBOND VIRTUAL MOBILITY PROGRAMME FKEE UTHM SEMESTER I 2020/2021 (START ON 4TH OCTOBER 2020)

OFFERED SUBJECTS:

1. Digital Electronics BEJ10603 (3 Credit Hours)
2. Analog Electronics BEJ10503 (3 Credit Hours)
3. Control System BEJ20503 (3 Credit Hours)
4. VLSI Design BED30303 (3 Credit Hours)
5. Power Electronics BEV30203 (3 Credit Hours)
6. Transform Circuit BEV20203 (3 Credit Hours)
7. Power Quality BEF44803 (3 Credit Hours)
8. Power Generation Transmission Distribution BEF36003 (3 Credit Hours)
9. Intelligent Control System (BEJ44103) (3 Credit Hours)

BEJ 10603 Digital Electronics

Synopsis:

The course begins with the introduction to digital systems, followed by representation of physical values in digital form. The basic logic gates and symbols are introduced covering Boolean expressions, truth tables and timing diagrams. Combinational logic gates is implemented in certain function, analyzing circuits to obtain its Boolean expression followed by logic simplification using Boolean theorem and Karnaugh-map approach. In digital arithmetic system, 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 the related flip-flop applications.

References:

1. Floyd, Digital Fundamental, Merill MacMillan, 2009. Call number: TK7868.D5 .F564 2009.
2. J. Tocci, Digital System, Principles and Application, Prentice Hall, 2011. Call number: TK7868.D5 .T62 2011.
3. M. Morris Mano, Charles R. Kime, Logic and Computer Design Fundamentals, 4th Ed., Prentice Hall, 2008. Call number: TK7888.4 .M36 2008.
4. Ferdjallah, Mohammed, Introduction to digital systems: modeling, synthesis, and simulation using VHDL /
5. Mohammed Ferdjallah., John Wiley, 2011. Call number:TK7868.D5 .F47 2011.
6. Kharate, G. K., Digital electronics, New Delhi: Oxford University Press, 2010. Call number: TK7868.D5 .K42 2010.

BEJ 10503 Analog Electronics

Synopsis:
This course provides a basic knowledge of semiconductor material in term of operation and its application in discrete electronic circuits. It covers the introduction of semiconductor theory which emphasis on the basic electronic semiconductor devices for example diode, bipolar junction transistor (BJT) and field-effect transistor (FET). Principles of biasing, small-signal analysis, large signal analysis and designing an electronic circuits will be introduced. Nevertheless, sub-topic on the Frequency Response of BJT and JFET, multistage amplifiers, cascade and configurations,
Differential amplifier, Power amplifiers: class A, B and AB are also covered in this course.

Pre-requisite: BEJ 10103 Electric Circuits I

References:

1. R.Boylestad, L. Nashelsky; Electronic Devices and Circuit Theory, 11 th Edition; Prentice Hall; 2013. Call number: TK7867.B69 2013.
2. Donald A. Neamen; Microelectronics Circuit Analysis and Design, 4 th Ed.; McGraw Hill, 2010. Call number: TK7867 .N434 2010.
3. Albert Paul Malvino, David J. Bates, Electronic Principles, 7th Ed., McGraw Hill, 2007. Call number: TK7816 .M34 2007.
4. Thomas L. Floyd, Electronics Fundamentals: Circuits, Devices and Applications, 8 th Ed., Prentice Hall, 2013. Call number:TK7816 .F56 2007.

BEJ 20503 Control Systems

Synopsis:
This course is about fundamental concepts of solving control systems problem. This course is organised in seven chapters. Chapter 1 presents an introduction to control systems. Chapter 2 provides introduction to Laplace transforms, transfer function, and mathematical modelling of dynamical systems (mechanical, electrical and electronic systems). Chapter 3 presents stability analysis of control systems and followed with chapter 4 which describes the time domain analysis of control systems. Chapter 5 and chapter 6 treats root locus method and frequency domain analysis respectively to analyze control systems while Chapter 7 deals with the basic properties of controllers including PID controller design.

Pre-requisite: BEE 11403 Engineering Mathematics II

References:

1. N. S. Nise. Control Systems Engineering, 6 th Edition. John Wiley, 2011. Call number: TJ213 .N57 2011.
2. R. C. Dorf and R. H. Bishop. Modern Control Systems, 11th Edition. Prentice Hall, 2008. Call number: TJ216 .D67 2008.
3. F. M. Golnaraghi and B. C. Kuo. Automatic Control System, 9 th Edition. John Wiley, 2010. Call number: TJ213 .K86 2010.
4. M. Gopal. Control Systems: Principle and Design, 2 nd Edition. Tata McGraw Hill, 2002. Call number: TJ213 .G66 2002.
5. K. Ogata. Modern Control Engineering, 5 th Edition, Prentice Hall, 2010. Call number: TJ213 .O32 2010.

BEJ 42603 VLSI System Design

Synopsis:
The course covers theory and techniques of very large scale integration (VLSI) system design in complementary metal oxide semiconductor (CMOS) technology. Students will be exposed to the fundamental of CMOS logic circuits, layout, fabrication and characterization as well as the crucial parameters to be considered in any VLSI system design.

Pre-requisite: BEJ 30503 Digital Design

References:

1. N. H. E. Weste and D. Hariis, CMOS VLSI design: a circuits and systems perspective. 4th ed. Addison Wesley, 2010. Call Number: TK7874 .W474 2011.
2. J. P. Uyemura, Chip design for submicron VLSI: CMOS layout and simulation. Thompson, 2006. Call Number: TK7871.99.M44 .U934 2006.
3. M. Michael Vai, VLSI Design. United State of America: CRC Press, 2001. Call Number: TK7874.75 .V34 2001.
4. S. –M. Kang and Y. Leblebici, CMOS Digital Integrated Circuits Analysis & Design. 3rd ed. McGraw-Hill, 2002. Call Number: TK7871.99.M44 .K36 2003.
5. W. Wolf, Modern VLSI Design Systems and Silicon. United State of America: Prentice Hall, McGraw-Hill, 1998. Call Number:K7874.65 .W64 1998.

BEV 30203 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. Mohan Ned, Undeland Tore M and Robbin William P, Power Electronics: Converters, Applications and Design, 3rd Edition, John Wiley, 2003. [TK7881.15 .M63 2003]
2. Rashid M.H, Power Electronics, Circuits, Devices and Applications, 3rd Edition, Prentice-Hall, 2004. [TK7881.15 .M5 2004]
3. Rashid M.H, SPICE for power electronics and electric power, 2nd Edition, Bota Raton, Taylor and Francis, 2006 [TK7881.15 .M83 2006]
4. Qing Chang Zhong, Control of power inverters in renewable energy and smart grid integration, John Willey, 2013 TK7872.C8 .Z46 2013
5. Rashid M.H, Alternative Energy in Power Electronics, Amsterdam : Butterworth-Heinemann, 2015, TK7881.15 .A47 2015

BEV 20203 Transform Circuit

Synopsis:
This course provides further study in the analysis of linear circuits using advanced mathematics. Topics include mathematical representation and operations on signal waveforms, 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.

Prerequisite Course(s): BEE11403 Engineering Mathematics II

References:

1. Irwin J D, Basic Engineering Circuit Analysis, MacMillan Publishing Co. 2011. Call Number: TK454 .I78 2011
2. Charles K. Alexander and Matthew N. O. Sadiku, Fundamentals of Electric Circuits, 5th Edition, McGraw-Hill, 2013. Call Number: TK454 .A3 2013
3. Hart W A, Kemmerly J E, Durbin S M, Engineering Circuit Analysis, McGraw-Hill 2007. Call Number: TK454 .H39 2007
4. DeCarlo R A, Pen-Min Lin, Linear Circuit Analysis, Prentice Hall, 2002. Call Number: TK454 .D33 2002
5. James W N and Susan A R. Electric Circuits, 9th Edition, Addison Wesley 2011. Call Number: TK454 .N54 2011

BEF 44803 Power Quality

Prerequisite Course(s): BEF 36003 Power Generation, Transmission and Distribution

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. Call number: TK1010 K46 2000 N1, TK1010 .K46 2000 N2
2. Roger C. Dugan, Mark F. McGranaghan, H. Wayne Beaty, Electrical Power Systems Quality, McGraw- Hill, 2000. Call number: TK1010 .D84 1996 N1, TK1010 .D84 1996 N2
3. C. Sankaran, Power quality, CRC press, 2002
4. Angelo Baggini, Handbook of power quality, John Wiley & Sons, Ltd, 2008

BEF36003 Power Generation, Transmission and Distribution

Synopsis:
The aim of this course is to provide students with a systematic understanding of the operation of a modern electrical power network which consists of the generation, transmission and distribution. The topics include various types of power generation technologies, a study of elements of transmission and distribution, the constants of transmission, the types of transmission system, the ac distribution and the characteristic of cables.

References:

1. Paul Breeze, Power Generation Technologies, Elsevier, 2005. Call number: TK1001.B74 2005
2. Chapman Stephen J., Electric Machinery and Power System Fundamentals, McGraw-Hill, 2002.Call number: TK2000 .C462 2002, TK2000 .C462 2002 N3, TK2000 .C462 2002 N4
3. Mohamed E. El-Hawary, Electrical Energy System, 2nd Ed., Taylor & Francis, 2007. Call number: TK1001 .E36 2000 N1
4. Marcelo Godoy Somoes, Alternative Energy System, Taylor & Francis, 2007. Call number: TJ808 .S56 2000
5. Sharma B.R, Transmission and Distribution of Electrical Power, New Delhi Satya Prakashan, 2000. Call number: TK3226 .S52 2000
6. Pansini, Anthony J, Taylor and Frencis, Power Transmission and Distribution, 2005. Call number: TK3001 .P36 2005
7. Leonard L.Grigby, Boca Raton Taylor and Francis, Electric Power Generations, Transmission and Distribution, 2007. Call number: TK1001 .E43 2007
8. A.S. Pabla, Electric Power Districution, New York McGraw-Hill, 2005. Call number: TK3001.P33 2005
9. Hadi Saadat, Power System Analysis, Boston McGraw-Hill 1999. Call number: TK1011 .S33 2002
10. J. Duncan Glover and Mulukutla S. Sarma, Power System Analysis and Design (3rd Edition), Brooks/ Cole Thomson Learning, 2002. Call number: TK1005 .G56 2007

BEJ 44103 Intelligent Control Systems

Synopsis:
This course provides students the comprehensive knowledges on Artificicial intelligent techniques applied to control system design. Topics include Neural Networks, Fuzzy Logic and Bayesian Networks (Kalman Filter and Particle Filter) and how to design such controller using Engineering Software.

References:

1. T. J.Ross, Fuzzy Logic with Engineering Application 2nd Edition, John Wiley & Sons Ltd, 2004. Call number: TA331 .R67 2004.
2. Satish Kumar, Neural Networks, A Classroom Approach, McGraw Hill, 2004. Call number: QA76.87 .K85 2004.
3. Leonid Reznik, Fuzzy Controllers, Newnes-Butterworth-Heinemann, 1997. Call number: TJ213 .R48 1997.
4. Callan, R., The Essence of Neural Networks, Prentice Hall, 1999. Call number: QA76.87 .C34 1999.
5. Simon Haykin, Neural Networks: A Comprehensive Foundation, Prentice Hall, 1999. Call number: QA76.87. H39 1999.