14AC (D-1-10) Teaching Assistance for Full Time Research Scholars:

The proposal made by University Research Committee in its 12th meeting to increase the amount of Teaching Assistance from Rs. 12000/- to 15000/- per month was approved by the Council. Further the Council emphasized that the Teaching Assistance should be provided against justified workload only. This will be implemented from July, 2016 onwards

The Council recommended that the matter be placed before the Finance Committee for consideration and approval

14AC (D-2) FACULTY OF ENGINEERING

14AC (D-2-1) Revamped Syllabi of Second Year B Tech Programme:

The Council approved the revamped syllabi of Second year B Tech Programme. It will be effective from batch 2015-19 onwards. It was suggested that all second year and onward courses be spelt out as per Outcome Based Education framework.

14AC (D-2-2) Scheme and Syllabi of M.Tech (Product Design) Programme:

The Council deliberated on proposed scheme and syllabi of M.Tech (Product Design) Programme with following suggestions:

a) Eligibility criteria for students seeking admission be specified.
   Necessary information in this regard be provided at the University website and Admission Brochure.
b) Programme electives be included
c) A Basic Design Philosophy Course may be offered in the first semester

The Council directed that the changes as per the above be incorporated in the scheme and syllabi of the programme and placed before the Chairman of the Academic Council for approval (prior to launch of Programme). The programme will be offered from academic year 2016-17.

14AC (D-2-3) Revised Curriculum of IV semester B Tech CSE/ IT/ C&C Programme:

The Council approved the revised scheme of IV semester B Tech CSE/ IT/ CC programmes as placed. Revision will be effective for 2015-19 batch.

MANIPAL UNIVERSITY JAIPUR

SCHOOL OF ENGINEERING, MANIPAL UNIVERSITY JAIPUR
SCHOOL OF ELECTRICAL, ELECTRONICS & COMMUNICATION ENGINEERING

DEPARTMENT OF ELECTRICAL & ELECTRONICS (E&E) ENGINEERING

MINUTES OF THE BOARD OF STUDIES (BOS) IX MEETING

Date	:	18TH Nov., 2015	Day : Wednesday	Time	: 11 AM	Venue :	Board Room 1A Building 2nd Floor
BOS Members Present		Dr. Rajesh Kumar, EE, MNIT; Prof.(Dr.) S. N. Sharan, Director(SEEC), MUJ; Dr. Ajay Kumar, MECT, MUJ; Prof. S. K. Jhajharia, EEE, MUJ; Prof. Amit Soni, EEE, MUJ; Dr. Amit Saraswat, EEE,MUJ; Mr. Manish Kumar Thukral, EEE, MUJ.					
BOS Members Excused		Dr. Vandana Suhag, Registrar, MUJ.					

Agenda Points

1. Welcome of the BOS Members by the Chairman BOS.
2. Review of the last BOS Minutes.
3. Discussion on Matter related to B. Tech. EEE 3rd & 4th Scheme and syllabus Revamp.
4. Vote of thanks

OUTCOME OF THE MEETING

No	Agenda Point	Discussion / Action
1	Welcome	• Chairman BOS welcomed all Board members
2		• Last BOS Meeting Minutes were reviewed.
3	Matter related to B. Tech. EEE 3rd & 4th Scheme and syllabus Revamp	• The scheme of 3rd and 4th Semester was discussed with all the members of BOS and the following changes were made in the existing scheme to reduce the credits and to make it more appropriate and balanced. • Subject Digital Electronic Circuit which is in 3rd semester of the existing scheme and Analog System Design which is in 4th semester of the existing scheme were combined and syllabus was modified accordingly and it is named as Analog and Digital Systems. This course is included in the 4th semester of the revised scheme. • Electrical Circuit Lab has been renamed as MATLAB and Circuit Simulation Lab with modifications in the syllabus. • The Integrated Lab-I and II of 3rd semester and 4th semester respectively were merged and syllabus is modified and shifted to 5th semester • The Electrical Machine Lab-I is shifted from 4th semester to 3rd semester and Electrical Machine Lab-II is shifted from 5th semester to 4th semester. • The AC machine portion in the Electrical Machine-I course is shifted Electrical Machine-II course. • As per the university guidelines the History course in 3rd semester and Economics course in 4th semester is included. • The course Digital System Design and Computer Architecture in 4th semester is replaced by Open Elective-I as per the university guidelines. • The course Signals and Systems of 4th semester is shifted to 5th semester and the course Measurement and Instrumentation is introduced in 4th semester from 6th semester.

Minutes of BOS

- The new laboratory named System Simulation and Virtual Instrumentation Lab is introduced in the 4th semester.
- The three courses for Open Elective-I to be offered by the Department in 4th semester and 6th semester were finalized and their syllabus was decided.

The BOS chairman appreciated the contribution of all the members and adjourned the meeting at 01:00 PM

18/11/15

Signature of HOD with Date:

MANIPAL UNIVERSITY JAIPUR

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGG

BOARD OF STUDIES MEETING

ATTENDANCE SHEET

18/11/2015

S.NO.	NAME OF THE MEMBER	SIGNATURE
1.	DR. S. N. SHARAN	
2.	DR. RAJESH KUMAR	
3.	DR. AJAY KUMAR	18.11.15
4.	DR. S. K. JHAJHARIA	
5.	DR. AMIT SONI	
6.	DR. AMIT SARASWAT	
7.	MR. MANISH THUKRAL	18/11/15

EE 1303 ELECTRICAL MACHINERY I [3 1 0 4]	EE 1303 ELECTRICAL MACHINERY I [3 1 0 4]
Transformers: types, principle, equivalent circuit, O.C and S.C. tests, losses, efficiency and regulation, All-day efficiency, polarity test, Sumpner's test, Cooling, Inrush current phenomenon, Parallel operation, tap changers, Auto-transformers, Connection of single phase transformers for three phase operation, Scott connection, Open delta, three-phase to six phase conversion, Harmonics, Three winding transformer, ~~**Three phase induction motors:** types, principle, equivalent circuit, windings design, no-load test, blocked rotor tests, circle diagram, cogging and crawling, induction generator, starting, deep bar and double cage motors, Speed control methods – voltage, frequency, rotor resistance, slip power recovery schemes, doubly fed machines~~, **D.C. Generators:** Construction, principle of operation, emf equation, types, winding design, armature reaction, commutation, characteristics, D.C. Motors: Principle of operation, types, torque equation, characteristics speed control, starters, testing. **References:** 1. M.G.Say, *Alternating Current Machines (5e)*, ELBS, 1994. 2. E.H.Langsdorf, *Theory of Alternating Current Machine (2e)*, TMH, 1994. 3. A.E. Clayton, *Performance and Design of DC Machines(3e)*, O& IBH, 1978	D.C. Generators: Construction, Principle of operation, EMF equation, Types, Winding design, Armature reaction, Commutation, Characteristics, D.C. Motors: Principle of operation, Types, Torque equation, characteristics speed control, starters, braking and testing. Transformers: Types, Principle, Equivalent circuit, O.C and S.C. tests, Losses, Efficiency and regulation, All day efficiency, polarity test, Sumpner's test, Cooling, Inrush current phenomenon, Parallel operation, tap changers, Auto-transformers, Connection of single phase transformers for three phase operation, Scott connection, Open delta, Harmonics, Three winding transformer, Special machines: Stepper motor, hysteresis motor, Reluctance motor, ac series motor. **Text Books:** 1. A. E. Fitzgerald, C. Kingsley, Jr. and S. D. Umans, Electric Machinery, Tata McGraw-Hill, 2003. 2. D. P. Kothari and I. J. Nagrath, Electrical Machines, TMH Publication, 2010. **References:** 1. I. L. Kosow, Electrical Machinery and Transformers, Pearson Education, 2007. 2. E. H. Langsdorf, Theory of Alternating Current Machine, TMH Publication, 2001.

EE 1402 ELECTRICAL MACHINERY II [3 1 0 4]	EE 1402 ELECTRICAL MACHINERY II [3 1 0 4]
Synchronous machines: Constructional features, e.m.f. equation, suppression of harmonics, Armature reaction: Effect of power factor on armature reaction - Non-salient pole alternator: Synchronous impedance, O.C. and S.C. characteristics – Power input & power output, voltage regulation, **Synchronisation:**Parallel operation of two alternators, Governor characteristics, alternator connected to infinite bus, Salient pole alternator: Two reaction theory, Blondel's diagram, Phasordiagram, voltage regulation, slip test power angle characteristics, **Synchronous motors:**Principle of operation, power input and power developed, performance characteristics, O-curve and V- curve, inverted V curve, synchronous condenser, methods of starting - Synchronizing power: Synchronizing power and torque, hunting, periodicity of hunting, damping - ~~Design of electrical machines: Design of main dimensions of transformer & rotating machines – Design of field pole of dc machine & alternator.~~ **References:** 1. M.G.Say, *Alternating Current Machinery*, (5e), ELBS Publishers, 1994. 2. E.H.Langsdorf, ,*Theory of Alternating Current Machine (2e)*, Tata Mc-Graw Hill, 1994. 3. A.K.Sawhney, *Design of electrical machines*, DhanpatRai& sons Publications, 1990.	Three phase induction motors: Types, principle, equivalent circuit, windings design, no-load test, blocked rotor tests, circle diagram, cogging and crawling, induction generator, starting, deep bar and double cage motors, Speed control methods – voltage, frequency, rotor resistance, slip power recovery schemes, Induction generators, single phase induction motor working principle, type and their applications, Synchronous machines: Constructional features, e.m.f. equation, suppression of harmonics, Armature reaction, Effect of power factor on armature reaction - Non-salient pole alternator, Synchronous impedance, O.C. and S.C. characteristics – Power input & power output, voltage regulation, Synchronization: Parallel operation of two alternators, Governor characteristics, alternator connected to infinite bus, Salient pole alternator: Two reaction theory, Blondel's diagram, Phasor diagram, voltage regulation, slip test power angle characteristics, Synchronous motors: Principle of operation, power input and power developed, performance characteristics, O-curve and V- curve, inverted V curve, synchronous condenser, methods of starting -Synchronizing power, Synchronizing power and torque, hunting, periodicity of hunting, damping. **Text Books:** 1. A. E. Fitzgerald, C. Kingsley, Jr. and S. D. Umans, Electric Machinery, TMH Publications, 2003. 2. M. G. Say, Alternating Current Machines, ELBS, 1994. **References:** 1. E. H. Langsdorf, Theory of Alternating Current Machine, TMH Publications, 2001. 2. D. P. Kothari and I.J.Nagrath, Electrical Machines, TMH Publication, 2010.

EE 1603 MEASUREMENTS AND NSTRUMENTATION [3 1 0 4]	EE 1401 MEASUREMENTS AND INSTRUMENTATION [3 1 0 4]
Basic concepts of measurements: System configuration, calibration - Errors in measurements, **Measuring instruments:** Permanent magnet moving coil, Moving iron and Electrodynamometer type Applications - Measurement of Resistance, **Inductance & Capacitance:** A.C. Bridges- Instrument Transformers: CT and PT –Transducers, Electrical transducers, Analog signal conditioning, Instrumentation amplifiers, v/f and i/f converters, sample and hold circuits, noise cancellation filters ,**Data conversion:** DAC –ADC –-,**Signal transmission:** Digital data transmission, Protocols – wired & wireless, Examples - I/O devices and displays.-,**Oscilloscopes:** Measurements using CRO - **Virtual Instrumentation:** Applications, Digital Energy Meter, ECG monitoring system. **References:** 1. A.K.Sawhney, A course in Electrical and Electronic Measurements and Instrumentation (4e), DhanpatRai& Sons, 1991. 2. E.W.Golding&F.C.Widdis, Electrical Measurements and Measuring Instruments (5e), Wheeler, 1989. 3. C.S. Rangan, G.R. Sarma&V.S.V. Mani, Instrumentation Devices and Systems (2e), Tata Mc-Graw Hill, 1998.	Basic concepts of measurements: System configuration, calibration - Errors in measurements, Measuring instruments: Permanent magnet moving coil, Moving iron and Electrodynamometer type, Measurement of Circuit Parameters: Low, Medium and High Resistance, Inductance & Capacitance-A.C. Bridges, Instrument Transformers: CT and PT, Transducers, Oscilloscopes, Analog signal conditioning, Instrumentation amplifiers, v/f and i/f converters, sample and hold circuits, noise cancellation filters , Data conversion: DAC, ADC, Signal transmission: Digital data transmission, Protocols - wired & wireless, Examples - I/O devices and displays, Virtual Instrumentation: Introduction to LabVIEW & its Applications, Digital Energy Meter, ECG monitoring system. **Text Book:** 1. A. K. Sawhney, A course in Electrical and Electronic Measurements and Instrumentation, Dhanpat Rai & Sons, 2012. 2. E. W. Golding & F. C. Widdis, Electrical Measurements and Measuring Instruments, Wheeler, 2011. **References:** 1. C. S. Rangan, G. R. Sharma & V. S. V. Mani, Instrumentation Devices and Systems, Tata Mc-Graw Hill, 1998.

EE 1301 ELECTRICAL CIRCUIT ANALYSIS [3 1 0 4] **Network theorems:** Superposition, Reciprocity, Thevenin's, Norton's, Substitution, Compensation, Maximum power transfer, and Millman's theorems, ~~**Locus diagrams:** Impedance, admittance and current locii of series and parallel circuits~~**, ~~Signals and waveforms:~~** ~~Classification of Signals, elementary signals, characteristics, representation of waveforms,~~ Transients in RL, RC, RLC circuits, Initial and final conditions, time domain specification, State variable representation of circuits, Laplace transforms – definition, properties, initial and final value theorems, inverse, Laplace transform of standard signals, periodic waveforms, transform circuits, analysis of networks by Laplace transform method, network functions, poles and zeros, ~~convolution integral,~~**Two-port network:** Two-port parameters, z-, y-, T- and h-parameters, relationship between parameters, inter-connection of two-port networks, ladder networks. **References:** 1. W. Hayt& J. Kemmerly, *Engineering Circuit Analysis (6e)*, Tata McGraw Hill, 2002. 2. F.F.Kuo,*Network Analysis and Synthesis (2e)*, Wiley, 1999. 3. V.Valkenberg, *Network Analysis (3e),* PHI Learning Publications, 1990.	**EE 1301 ELECTRICAL CIRCUIT ANALYSIS [3 1 0 4]** Network theorems: Superposition, Reciprocity, Thevenin's, Norton's, Substitution, Compensation, Maximum power transfer, and Millman's theorems, Graph Theory. Types of Test Signals: Impulse, Step, Ramp, Sinusoidal, Transients in RL, RC, RLC circuits, Initial and final conditions, Time domain specification, State variable representation of circuits, Review of Laplace transforms, Analysis of networks by Laplace transform method, Network functions, Poles and Zeros, Two-port network: Two-port parameters, Z, Y, T and h-parameters, Relationship between parameters, Inter-connection of two-port networks, Ladder networks, Coupled circuit, Network Synthesis. **Text Books:** 1. W. Hayt & J. Kemmerly, Engineering Circuit Analysis, Tata McGraw Hill, 2002. **References:** 1. F. F. Kuo, Network Analysis and Synthesis, Wiley, 1999. 2. V. Valkenberg, Network Analysis, PHI Learning Publications, 1990.

MA1303 ENGINEERING MATHEMATICS III [4 0 0 4] Complex Variables: C-R equations, conformal mappings, bilinear transformation, Taylor's and Laurent Series, Residues, **Fourier series, Fourier Transforms,** PDE, Study of wave and Heat equations, z-transforms, Difference Equations. ~~**Numerical methods** interpolation and extrapolation,Numerical differentiation & integration~~.**Vector calculus:** Gradient, Divergence and curl, Line, surface and volume integrals, related theorems. **Text Books**: 1. B. S. Grewal, *Higher Engineering Mathematics*, Khanna Publishers. ~~2. E. Kreyszig, *Advanced Engineering Mathematics*, Wiley Eastern~~ ~~**References:**~~ 1. ~~S. S. Sastry, *Introductory Methods of Numerical Analysis*,~~ PHI.	**MA1310 ENGINEERING MATHEMATICS III [2 1 0 3]** Vector calculus Tensor: Gradient, Divergence and Curl, Line, Surface and Volume integrals, related theorems. Transformation of co-ordinates: Curvilinear, Cylindrical, Spherical Co-ordinate systems. Complex Variables: C-R equations, conformal mappings, bilinear transformation, Taylor's and Laurent series. Laplace Transforms: Transforms of Elementary functions, inverse transforms, convolution theorem. Application of Laplace transforms in the solutions of differential equations. Fourier series: Fourier series, Dirichlet's condition, Even and Odd functions, Half Range series, Harmonic Analysis. Fourier & Z Transforms. Fourier integrals, Complex Fourier transform, Fourier sine & cosine transforms, Solution of difference equations using z-transforms. **Text Books:** 1. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, Delhi, 2006. 2. Srimanta Pal, Subhdh C. Bhunia, Engineering Mathematics, Oxford University Press, 2015. 3. H. K. Das, Advanced Engineering Mathematics, S. Chand, 2015.

EE 1304 ELECTROMAGNETIC THEORY [3 1 0 4]	EE 1302 ELECTROMAGNETIC FIELD THEORY [2 1 0 3]
Electrostatics: Coulomb's law – Gauss law and applications, Divergence theorem, Electric scalar potential: Potential gradient, boundary conditions for dielectric materials, capacitance of parallel plate capacitor, co-axial cable, two wire line, Energy density in an electric field, Laplace's and Poisson's equations, **Magnetostatics:**Biot-Savart's Law and applications, Ampere's circuital law and applications, Curl – Stoke's theorem, magnetic flux and flux density, Magnetic boundary conditions, Inductance – Inductance of toroid, solenoid, two wire line, coaxial cable, **Faraday's law:** transformer emf, motional emf., Concept of displacement current – Electromagnetic waves, Maxwell's equations in integral and point form, uniform plane wave, wave motion in free space and in conductors, concept of skin depth – Poynting's Theorem and wave power, Reflection of uniform plane waves at normal incidence angle ~~and at oblique incidence angle Standing wave ratio.~~ **References:** 1. W .Hayt, *Engineering Electromagnetics (7e)*, Tata Mc-Graw Hill, 2006. 2. J. D.Kraus, *Electromagnetics (4e)*, MGH, 1992. 3. K.A.Gangadhar, & M. Ramanathan, *Field Theory (5e)*, Khanna Publishers, 1982.	Electrostatics: Coulomb's law, Gauss law and applications, Divergence theorem, Electric scalar potential: Potential gradient, Boundary conditions for dielectric materials, Capacitance of parallel plate capacitor, Coaxial cable, Two wire line, Energy density in an electric field, Laplace's and Poisson's equations. Magnetostatics: Biot-Savart's Law and applications, Ampere's circuital law and applications, Curl, Stoke's theorem, magnetic flux and flux density, Magnetic boundary conditions, Inductance, Inductance of toroid, solenoid, two wire line, coaxial cable, Faraday's law, transformer Emf, motional Emf. Time Varying Fields: Concept of displacement current, Electromagnetic waves, Maxwell's equations in integral and point form, uniform plane wave, wave motion in free space and in conductors, concept of skin depth , Poynting's Theorem and wave power, Polarization, Reflection of uniform plane waves at normal incidence angle. **Text Books:** 1. W. Hayt, Engineering Electromagnetics, Tata Mc-Graw Hill, 2006. 2. J. D. Kraus, Electromagnetics, MGH, 1992. **References:** 1. K.A.Gangadhar, & M. Ramanathan, Field Theory, Khanna Publishers, 1982. 2. Joseph Edminister, Schaum's Outline of Electromagnetics, (Schaum's Outline Series), 2013.

EE 1330 ELECTRICAL CIRCUITS LABORATORY [0 0 3 1] **Module I:** Electric circuit simulation using MATLAB – script files, data visualization, functions, file I/O and GUI,**Introduction to SIMULINK:** Steady state analysis of circuits – Transient analysis of RL, RC, and RLC circuits using ODE solver - , Circuit simulation using Simscape, **Module II:**Electric circuit simulation using PSPICE – Steady state & transient analysis of DC & AC circuits,**Module III:**Measurement and experimental verification of network theorems – Measurement of power, power factor and pf correction – Three phase power measurement – ~~Measurement of self and mutual inductance.~~ **References:** 1. D.Hanselman, *Mastering MATLAB 7*, Pearson Education, 2005. 2. M.H.Rashid, *SPICE for circuits and Electronics using PSPICE*, PHI Learning publications, 1995.	**EE 1332 MATLAB & CIRCUITS SIMULATION LABORATORY [0 0 2 1]** Module I: Introduction to MATLAB, Electric circuit simulation using MATLAB, script files, data visualization, functions, file I/O and GUI, Introduction to SIMULINK, Steady state analysis of circuits, Transient analysis of RL, RC, and RLC circuits, Circuit simulation using Simscape. Module II: Electric circuit simulation using PSPICE, Steady state & transient analysis of DC & AC circuits. Module III: Measurement and experimental verification of network theorems, Evaluation and verification of Two port network parameters, Measurement of power, power factor and pf correction, Three phase power measurement. **Text Books:** 1. D. Hanselman, Mastering MATLAB 7, Pearson Education, 2005. 2. M. H. Rashid, SPICE for circuits and Electronics using PSPICE, PHI Learning publications, 1995.

EE 1401 SIGNALS AND SYSTEMS [3 1 0 4] **Time domain analysis of continuous-time and discrete-time signals & systems:** linear-time invariant systems, impulse response, convolution, correlation, causality and stability, representation of LTI systems,**Frequency domain analysis of continuous time signals and systems**: Fourier series, Fourier transform, applications, Frequency domain analysis of discrete-time signals and systems, Discrete-time Fourier series, Discrete-time Fourier transform,**sampling in time domain**: reconstruction, discrete-time processing of continuous-time signals, Relation between frequency domain representation in continuous and discrete-domain, Sampling in frequency domain,**Discrete Fourier transform:**Transform domain analysis of systems, Laplace and Z transform, representation of systems, **signal flow graph**: modeling on of a z-domain transfer function, relation between s-plane and z-plane. **References:** 1. S.Haykin, *Signals and Systems*, Wiley, 1999. 2. A.V. Oppenheim, A.S. Williskyand S.H. Nawab, *Signals and Systems (2e)*, PHI Learning Publications, 1997. 3. R.E.Ziemer, W.H.Tranter&D.R.Fannin, *Signals and Systems (4e)*, Pearson, 2002.	**EE 1401 SIGNALS AND SYSTEMS [3 1 0 4]** Introduction to signals, classification of signals, mathematical operation on signals, **Time domain analysis of continuous-time and discrete-time signals & systems:** linear-time invariant systems, impulse response, convolution, correlation, causality and stability, representation of LTI systems,**Frequency domain analysis of continuous time signals and systems**: Fourier series, Fourier transform, applications, Frequency domain analysis of discrete-time signals and systems, Discrete-time Fourier series, Discrete-time Fourier transform,**sampling in time domain**: reconstruction, discrete-time processing of continuous-time signals, Relation between frequency domain representation in continuous and discrete-domain, Sampling in frequency domain,**Discrete Fourier transform:**Transform domain analysis of systems, Laplace and Z transform, representation of systems,**signal flow graph**: modeling on of a z-domain transfer function, relation between s-plane and z-plane. **References:** 1. S.Haykin, *Signals and Systems*, Wiley, 1999. 2. A.V. Oppenheim, A.S. Williskyand S.H. Nawab, *Signals and Systems (2e)*, PHI Learning Publications, 1997. 3. R.E.Ziemer, W.H.Tranter&D.R.Fannin, *Signals and Systems (4e)*, Pearson, 2002.	