JABALPUR ENGINEERING COLLEGE, JABALPUR (MP)
(An Autonomous Institute of Govt. of M.P.)
Affiliated to Rajiv Gandhi Technological University, Bhopal (MP)
Scheme of Study and Examination   (w.e.f. July 2011)

BE (PTDC)   Second Sem.   Branch : Electrical Engineering

Course Code	Subject	Periods			Evaluation Scheme					Credits
		L	T	P	Sessional Exam			ESE	Sub Total	
					TA	CT	TOTAL			
MA-02	Mathematics - II	3	1	-	10	20	30	70	100	4
EE-09	Electrical Machine - I	3	1	-	10	20	30	70	100	4
EE-11	Drawing Estimation & Costing	3	1	-	10	20	30	70	100	4
EE-16	Power System	3	1	-	10	20	30	70	100	4
(PRACTICAL/DRAWING/DESIGN)										
EE-10L	Electrical Machine Lab - I	-	-	2	20	-	20	30	50	2
EE-17L	Power System Lab	-	-	2	20	-	20	30	50	2
EE-53L	Professional Activity - I	-	-	2	20	-	20	30	50	2
EE-59L	Seminar/Group Discussion	-	-	2	50	-	50	-	50	2
	Total	12	4	8	150	80	230	370	600	24

T.A. Teachers Assessment, CT- Class Test, ESE - End Semester Examination, Total
Marks 600 Total Periods : 24, Total Credits : 24

COURSE CONTENT & GRADE   (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E. Common	**ENGINEERING MATHEMATICS - II**	MA-02	Min "D"	Min "D"	5.0

ENGINEERING MATHEMATICS-II

UNIT-I

Second order ordinary differential equation with variable coefficents using methods, one solutionis known, Removal of First Derivative, Change of independent variable Method of Operational factor, Method of variation of parameters, solution of Second order ordinary differential equation by series method.

Unit-II

Bessel's equation, recurrence relations, Orthogonality, Generating Function of $J_n(x)$, Trigonomatric expansion involving Bessel's functions , Legendre's equation, , Legendre's Polynomial $P_n(x)$, Rodrigue's formula, Recurrence relation's, Generating functiuon of $P_n(x)$, Orthogonality, error function .

Unit-III

Partial differential equation, Formulation of PDE, solution of first order linear PDE, first order non-linear PDE, Homogenous linear PDE with constant coefficients of second and higher order, Method of separation of variable. Appluication of PDE in solution of one dimensional Heat and Wave equation

Unit-IV

Vector Calculus, Vector differentiation, Velocity and Acceleration, Gradient, Divergence and Curl, Line and Surface iIntgral, Stoke and Gauss's divergence theorem.

Unit-V

Binomial, Poisson and Gaussian (Normal) Distribution and their properties, Curv fitting bymethod of least square, Elementary concept of Reliability, Forecasting and decision theory

Reference Books:-

1.   Higher Engineering Mathematics by B.V. Ramana TMH.
2.   Adv.Engineering Maths by Ervin Kreszig, Wiley India IIT Student ed. 8th.
3.   Higher Engineering Mathematics- By B.S. Grewal.
4.   Mathematical Statistics- by Ray & Sharma.
5.   Advance Engineering Mathematics-Wylie and Barrett.TMH.
6.   Introduction to Theory of statistics- Mood,TMH.
7.   Partial Differential Equation-Duchateau Schaum Series TMH.

COURSE CONTENT & GRADE   (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	**P**	
	ELECTRICAL MACHINES-I	EE-09	Min "D"	Min "D"	5.0

ELECTRICAL MACHINES -I

Unit I 1 phaseTransformers: Construction, working principle, emf equation, equivalent circuit, phasor diagrams, voltage regulation, efficiency, all day efficiency calculation, ratio polarity, load test, S.C. & O.C. test, rating of transformers.

UnitII 3 Phase transformers: construction, advantages of 3 phase transformers, connections (Δ- Δ, Δ-Y, Y- Δ, Y-Y, open Δ), vector phase group, 3 phase to 2 phase conversion (Scott connection) and its applications, 3 phase to 6 phase transformation, three winding transformers, its equivalent circuit,sumpner's back to back test,parallel operation and load sharing, problem of circulating current and harmonics in three phase transformer, cooling, conservator breather, buchholz relay.

Unit III DC Machine(I): Constructional features, emf equation, classification on the basis of excitations, armature winding, lap winding, wave winding, operation as generator, operating characteristics, armature reaction & commutation, compensating winding, losses efficiency, power output equation.

Unit IV DC MachinesII: Operation as motor, torque equation, operating circuits of motor, types of DC motors, starting and speed control, ward Leonard method, solid state control, Swinburn's test, Hopkinson's test, braking, starters.

Unit V Induction motor: Construction, working principle, double revolving field theory,
Phasor diagram, equivalent circuit. Determination of equivalent circuit, parameter
by no load and block rotor test, starting methods and types of 1-φ Induction motor.

References:
1. Nagrath and Kothari "Électrical Mchines", TMH Publication.
2. P.S.Bhimbra ,"Electrical Machinery" Khanna. Publication
3. Langs Dorf "AC machines" TMH Publication
4. Ashfaq Hussain "Electrical Machines" Dhanpat Rai. Publication
5. H.Cotton," Electrical Technology" CBS Publication

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	DRAWING ESTIMATION & COSTING	EE-11	Min "D"	Min "D"	5.0

DRAWING ESTIMATION & COSTING

Unit I   Conventional symbols for electrical and electronics components, instrument and equipments. Lamps circuits, corridor wiring, staircase wiring and god own wiring. Fluorescent, sodium, mercury, neon sign, battery charging, house appliance.

Unit II   Under ground cables, cable joints and multi-core cables, types of three phase cables, Insulators, bushing, DC and AC motor starter.

Unit III Pole and Pipe earthing, service connection, I-E rules for ground clearance, wiring of technical institution, pole mounted transformer, developed diagram of DC and AC machine winding.

Unit IV Internal winding of DC machine, plan elevation and side view of transformer, DC machine, Synchronous machine and Induction motor.

Unit V Plan, circuit diagram, estimating and costing of internal house wiring.

Reference Books:

1. Dragan C.R.," Electrical Drawing & Estimating",.
2. Narang K.L,"Electrical Engineering Drawing".
3.   S.L.Uppal.,"Estimating and Costing ".

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	**P**	
	POWER SYSTEM	EE-16	Min "D"	Min "D"	5.0

POWER SYSTEM

Unit I Transmission Systems: Various systems of AC transmission and their comparison, comparison of HVAC & HVDC transmission, their merits & demerits, substation layout, voltage regulators.

Unit II Overhead Transmission Lines: Types of conductors, Line parameters: calculation of inductance and capacitance of single circuit transmission lines, three phase lines with stranded and bundle conductors, generalized ABCD constants and equivalent circuits of short, medium & long lines. Line performance, regulation and efficiency of short, medium and long lines, series and shunt compensation, FACTS. Real & Reactive power flow, surge impedance, SIL.

Unit III Distribution systems: Primary and secondary distribution systems, concentrated and Uniformly distributed loads on distributors fed at one and both ends, ring distribution, voltage drop and power loss calculations, Feeders Kelvin's law and modified Kelvin's law for feeder conductor size and its limitations.

Unit IV Overhead Line Insulators: Types, string efficiency, grading ring, preventive maintenance. Mechanical design of transmission lines: Different types of tower, sag-tension calculations, strings charts, vibration dampers, line supports, spacing of conductors and ground. Corona losses, radio and audio noise, transmission line- communication line interference.

Unit V Cables: Classification, construction and characteristics of different types. Insulation resistance and capacitance, grading (capacitance and inter sheath), phenomenon of dielectric losses, dielectric stress and sheath loss in cables.

References:
1. Nagrath I J and Kothari DP; "Power System Engineering", Tata McGraw Hill.
2. John S. Grainger and W.D. Stevenson Jr., "Power System Analysis", McGraw Hill.
3. Deshpande M V; "Electric Power System Design", TMH.
4. Central Electricity Generating Board; "Modern Power System Practice", Vol 1-8 Pergamon Oxford.
5. James J. Burke, "Power Distribution Engineering: Fundamentals and Applications", Marcel Dekker.
6. Westinghouse Electric Corporation; Electric Transmission & Distribution Reference Book; East Pittsbrg.
7. Wadhwa C L ; "Electrical Power System" Wiley Eastern Limited.
8. Ashfaq Hussain; "Electrical Power System".
9. Gupta B R; "Power System Analysis and Design"

Ray; "Electric Power System

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	**P**	
	ELECTRICAL MACHINE LAB-I	EE-10L	Min "D"	Min "D"	5.0

ELECTRICAL MACHINE LAB-I

Experiments

1. To perform OC & SC test on single phase transformer.

2. To perform back to back test on two, 1-φ transformer.

3. To perform three to two phase conversion using Scott's connection.

4. To perform speed control of DC shunt motor using armature and field control.

5. To determine magnetization characteristics of DC generator.

6. To determine η of DC motor by using Swinburn's test.

7. To perform lord test on Dc generator.

8. To study different methods of starting of single phase induction motor.

9. To perform no load and block for test on single phase induction motor.

10. Study of DC motor starters.

COURSE CONTENT & GRADE   (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	**P**	
	POWER SYSTEM LAB	EE-17L	Min "D"	Min "D"	5.0

POWER SYSTEM LAB

List of Experiments

1. Electrical design of transmission line.
2. Mechanical design of transmission line.
3. Drawing of tower structure
4. Drawing of insulators.
5. Study about different types of cables.
6. Study of different types of Distribution Systems
7. Fault detection of cable by using Megger.
8. Simulation of Ferranti effect using MATLAB.
9. Modeling & Simulation of Transmission line parameter using MATLAB.
10. Programmers based on sag calculation for different land terrain

COURSE CONTENT & GRADE   (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	**P**	
	PROFESSIONAL ACTIVITY- I	EE-53L	Min "D"	Min "D"	5.0

PROFESSIONAL ACTIVITY- I
(Suggested Exercise)

- Student shall visit a nearby Industry and shall prepare a technical report suggesting some improvement in operation.
- Student shall Design and fabricate a new laboratory equipment. He shall prepare a design report.
- Student shall improve an existing lab equipment and prepare chart or lab manual .
- Student shall publish a review paper in some Indian Journal.
- Student shall make a report on an Industry employing latest technology/ Innovation.
- Student shall prepare a working model of a machine part.
- Student shall make a software/ comp. program for the Institute to enhance efficiency in its working.
- Student shall prepare a detailed project report to start a small-medium enterprise.
- A group of student shall register with the Industry cell and submit a report on work done there about Institute-Industry linkage.
- Experimental work on a new set of equipments.
- Seminar Presentation with a report submitted to the supervisor.

Note : The list of activities can be modified as per requirements of the
department.

A hand written report of about 30 pages duly signed by the student and the concerned teacher should be submitted.

COURSE CONTENT & GRADE   (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	**P**	
	SEMINAR/GROUP DISCUSSION	EE-59L			5.0

Objectives of Group Discussion & Seminar is to improve the Mass Communication and Convincing/ understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves.

Evaluation will be done by assigned faculty based on group discussion and power point presentation.