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 2010)

M.E. IIISem. Branch : Electrical Engg. Specialization : High Voltage Engineering

Course Code	Subject	Periods			EVALUATION SCHEME					Credits
					SESSIONAL EXAM			ESE	SUB TOTAL	
		L	T	P	TA	CT	TOT			
EE-139	Transient in Transformer & Machines	3	1	-	10	20	30	70	100	4
	Elective - III (Any One)									
EE-119C	SCADA	3	1	-	10	20	30	70	100	4
EE-140A	Power Quality									
(PRACTICAL/DRAWING/DESIGN)										
EE-141L	Seminar/ Project	-	-	4	100	-	100	-	100	4
EE-142L	Industrial Training (4 weeks)	-	-	-	-	-	-	100	100	4
EE-143L	Preliminaries of Dissertation	-		4	40	-	40	60	100	4
	Total	**6**	**2**	**8**	**160**	**40**	**200**	**300**	**500**	**20**

T.A. Teachers Assessment, CT- Class Test, ESE - End Semester Examination, Total Marks 500
Total Periods : 16 Total Credits :20

NOTE : The students shall go on industrial training at the end of second semester and the evaluation shall be done at the end of third semester. The student has to present a report on the training and also has to face a viva voice examination infront of a panel headed by head of the department. The seminar /project shall be asigned by the supervisor

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	
	TRANSIENT IN TRANSFORMER & MACHINES	EE-139	Min "D"	Min "D"	5.0

TRANSIENT IN TRANSFORMER & MACHINES

Unit I Construction and arrangement of insulation in a power transformer. Voltage distribution along HV winding and method of improving it.

Unit II Surge phenomenon in single layer coils and in two electrical and magnetically coupled single layer coils.

Unit III Surge phenomenon in transformers, single-phase and three –phase.

Unit IV Surge phenomenon in rotation machines, surge voltage transients in rotating machines. Over – voltage during switching off squirrel cage motors. Protection of rotating machines from surges.

Unit V Insulation of HV rotating machines. Insulation and its typical construction, new insulating materials. Elimination of corona, testing of machine insulation.

BOOKS RECOMMENDED:

1. B.Holler & A. Veverka," Surge Phenomenon in Electrical Machines" ILIFFE.
2. D.V.Razevig," High Voltage Engineering" Khanna Publishers, Delhi.

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	
	SCADA	EE-119C	Min "D"	Min "D"	5.0

SCADA

Unit I Introduction to SCADA and PLC: SCADA Data acquisition system, evaluation of SCADA, communication technologies, monitoring and supervisory functions.PLC: Block diagram, programming languages, Ladder diagram, Functional block diagram, Applications, Interfacing of PLC with SCADA

Unit II SCADA system components: Schemes, Remote Terminal Unit, Intelligent Electronic Devices, Communication Network, SCADA server.

Unit III SCADA Architecture: Various SCADA Architectures, advantages and disadvantages of each system, single unified standard architecture ,IEC 61850 SCADA / HMI Systems.

Unit IV SCADA Communication: Various industrial communication technologies- wired and wireless methods and fiber optics, open standard communication protocols.

Unit V Operation and control of interconnected power system- Automatic substation control, SCADA configuration, Energy management system, system operating states, system security, state estimation. SCADA applications Utility applications, transmission and distribution sector operation, monitoring analysis and improvement. Industries oil gas and water. Case studies, implementation, simulation exercises.

Text Books

1. Stuart A Boyer," SCADA supervisory control and data acquisition"
2. Gordan Clark, Deem Reynders," Practical Modem SCADA Protocols"

Reference Books

Sunil S. Rao," Switchgear and Protections", Khanna 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	
	POWER QUALITY	EE-140A	Min "D"	Min "D"	5.0

POWER QUALITY

Unit I Introduction power quality: voltage quality, power quality evaluation Procedure, term and definition, general classes of power quality problem, causes & effect of power quality disturbance.

Unit II Voltage sags and interruption: sources of sags and interruption, estimating voltage sag performance, fundamental principles of protection monitoring sags.

Unit III Transients over voltages: sources of transients over voltages, principles of over voltage protection, utility capacitor switching transients, fundamentals of harmonics and harmonics distortion, harmonic sources from commercial load and from industrial loads.

Unit IV Applied harmonics: harmonics distortion evaluations, principles for controlling harmonics, studies devices for controlling harmonic distortion, filters, passive input filter standards of harmonics.

Unit V Electro-magnetic compatibility, constant frequency control, constant tolerance band control, variable tolerance band control, discontinuous current control.

Reference Books

1. R.C.Duggan,"Power Quality"
2. A.J.Amillga,"Power System Harmonics"
3. Derek A.Paice,"Power Electronics Converter Harmonics"

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/PROJECT	EE-141L			5.0

SEMINAR/PROJECT

The student shall take up a small project under the supervision of a supervisor and shall complete the task. He has to present the report before a committee credit by H.O.D. and answer the queries

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	
	INDUSTRIAL TRAINING	EE-142L	Min "D"	Min "D"	5.0

INDUSTRIAL TRAINING

The student shall go to an Industry at the end of Second Semester during summer and shall prepare a report on the Practical Training undergone there. He has to present the report at the time of practical examination of Third Semester.

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	
	PRELIMINARIES OF DISSERTATION PRESENTATION	EE-143L	Min "D"	Min "D"	5.0

PRELIMINARIES OF DISSERTATION PRESENTATION

The student shall prepare a literature review of the dissertation work to be undertaken. He shall also prepare the scheme of dissertation