

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **EE 309**

SUBJECT NAME : **Switch Gear and Protection**

FACULTY NAME : **RAM DAYAL RATHOR**

DESIGNATION : **LECTURER (Electrical)**

TOPIC	LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC	MONTHS IN WHICH THE TOPIC WILL BE COVERED	ACTUAL DATE OF COVERING OF THE TOPIC	REASON FOR NOT COVERING THE TOPIC IN DUE TIME	E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC
Faults in Power System :Sources of faults Percentage reactance and base KVA	1	Aug-15			
Percentage reactance and base KVA	1	Aug-15			
3-phase short circuits on alternator	1	Aug-15			
Calculations of short-circuit KVA current	1	Aug-15			
Numericals	2	Sep-15			
Construction of reactors,Limitations of fault current.Location of reactor	1	Sep-15			
Symmetrical Components :Operator 'a',Determination of sequence components	1	Sep-15			
Sequence impedance and sequence network	1	Sep-15			
Types of faults at the terminals of unloaded alternator	1	Sep-15			
Determination of fault current	1	Sep-15			
Numericals	1	Sep-15			
Fuses :Definition of different terms	1	Oct-15			
Selection of fuse materials,Types of fuses	1	Oct-15			
Application of H.R.C.	1	Oct-15			
Advantage and disadvantage of fuses	1	Oct-15			
Circuit Breakers :Basic construction of circuit breaker	1	Oct-15			

Arc phenomenon,Arc extinction methods	1	Oct-15			
Interruption of capacitive current,Current chopping,Resistance switching	1	Oct-15			
Construction, working and application of Oil circuit breaker	1	Oct-15			
Air Circuit breaker,Air blast circuit breaker,Vacuum circuit breaker	2	Nov-15			
SF ₆ circuit breaker,Ratings of circuit breaker	1	Nov-15			
Protection :Principle of protection systems ,Basic requirement of relays	1	Nov-15			
Classification of relays according to construction, uses and operating time	1	Nov-15			
Types o f relays (construction, setting and applications)	1	Nov-15			
Thermal relay,Electromagnetic relay,Induction type relay	1	Nov-15			
Differential type relay,Distance	1	Nov-15			
Over current, reverse power and earth leakage protection,	1	Oct-15			
Static relays,Basic elements,Applications	2	Nov-15			
Protection of Alternator :Field failure,Field earth fault,Over current	1	Dec-15			
Phase unbalance and insulation protection,Differential and restricted earth fault schemes	2	Dec-15			
Protection against prime mover failure	1	Jan-16			
Transformer Protection :Over current,Earth fault	1	Jan-16			
Differential protection,Buchholz relay	1	Jan-16			
Differential scheme for the protection of generator - transformer units.	1	Jan-16			

Line Protection :Differential pilot wire protection systems	1	Jan-16			
Time graded directional over current and earth fault protection	2	Jan-16			
Elements of distance protection and power line carrier protection	2	Feb-16			
Over Voltage Protection :Causes of over voltage,Lightning surges	1	Feb-16			
Protection of line against over voltage	2	Feb-16			
Function of ground wire,Horn gap,Lightening arrestors	1	Feb-16			
Insulation coordination	1	Mar-16			
Revision	12	mar-apr16			

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **EE 203**

SUBJECT NAME : **Basic Electrical Engineering**

FACULTY NAME : **RAM DAYAL RATHOR**

DESIGNATION : **LECTURER (Electrical)**

TOPIC	LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC	MONTHS IN WHICH THE TOPIC WILL BE COVERED	ACTUAL DATE OF COVERING OF THE TOPIC	REASON FOR NOT COVERING THE TOPIC IN DUE TIME	E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC
Resistance, specific resistance, Ohm's law, Resistance in series, parallel and series parallel circuits.	1	Aug-15			
Kirchhoff's laws	1	Aug-15			
Application of Kirchhoff's laws	1	Aug-15			
Capacitor, Capacitance of an isolated sphere	1	Aug-15			
Parallel plate capacitor' Special cases of parallel plate capacitor	1	Sep-15			
Cylindrical capacitor, Capacitor in series and parallel. Capacitor with compound dielectric	1	Sep-15			
Energy stored in capacitor, Charging and discharging of a capacitor, time constant, Different types of capacitor used in various electrical applications.	1	Sep-15			
Charging and discharging of a capacitor, time constant	1	Sep-15			
Different types of capacitor used in various electrical applications.	1	Sep-15			
Introduction OF magnetic circuit, Comparison between magnetic circuit and electric circuits	1	Sep-15			
Behavior of magnetic circuits, Composite magnetic circuits	1	Sep-15			
Parallel magnetic circuits, B-H curve	1	Sep-15			
Rise of current in inductive circuit, Decay of current in inductive circuit	1	Oct-15			
Phasor Algebra : Mathematical representation of a vector, Symbolic notation	1	Oct-15			
Significance of operator-j, Conjugate complex number	1	Oct-15			
Trigonometrical form of vector representation, Exponential form of vector representation, Polar form of vector representation	1	Oct-15			

Addition and subtraction of vector, Multiplication and division of vector quantity, 120o operator	1	Oct-15			
Alternating quantity and its equation, Maximum, Average and RMS values. Form factor	2	Oct-15			
Behaviour of R, L and C in A.C. circuits	1	Oct-15			
A.C. through R-L circuit, power factor, active and reactive component of current, power, Q-factor of a coil	1	Oct-15			
		Nov-15			
A.C. through R-C circuit, dielectric loss and power factor of a capacitors	1	Nov-15			
Solving series R-L-C circuits	1	Nov-15			
Solving A.C. parallel circuit by phasor	1	Nov-15			
Solving A.C. series and parallel circuits.	1	Nov-15			
Polyphase System :Need and advantage of 3-phase system, Generation of 3-phase voltage	1	Nov-15			
Phase sequence, Star-Delta connections	1	Nov-15			
Phase and Line relations of voltage and current in star -delta connections (for balanced load), Expression of power in 3-	1	Nov-15			
Battery :Types of storage batteries, Construction and working of Lead acid batteries, Ni-Fe batteries and Lithium ion batteries	2	Dec-15			
Discharging and recharging of Lead acid batteries	1	Dec-15			
Ampere and watt-hour efficiencies	1	Dec-15			
Classification of Electrical Engineering Materials :	1	Dec-15			
General requirement of electrical engineering materials, Classification of materials into conducting, semi-conducting and insulating materials through a brief reference to atomic structure	1	Jan-16			
Conducting Materials :Resistivity, Factors affecting resistivity such as Temperature, Alloying, Aging effect	1	Jan-16			
General Properties of following materials Low Resistivity Materials ,High resistivity materials, Bruch materials, Contact materials	1	Jan-16			
Insulating Materials :Electrical properties, Volume resistivity, Surface resistance	1	Jan-16			
Dielectric strength, Dielectric constant	1	Jan-16			

Physical, Thermal, Chemical properties, Ceramics, Mica and mica products, Asbestos and asbestos products, Glass and glass products, Natural and synthetic rubber, PVC, Bakelite	1	Jan-16				
Classification of insulating materials on the basis of temperature limit	1	Feb-16				
Composition, properties and applications of - Fibrous materials,	1	Feb-16				
Properties of liquid insulating materials such as - Transformer oils, Mineral insulating oils	1	Feb-16				
Properties of gaseous insulating materials such as- Hydrogen, Air, SF ₆	1	Feb-16				
Magnetic Materials :Terminology and classification, Diamagnetic material, Paramagnetic material, Ferromagnetic material,	2	Feb-16				
Effect of Curie temperature, Soft and hard magnetic materials,	1	Feb-16				
Different magnetic materials such as- Soft ferrites, Silicon steel, Nickel Iron alloys, Cobalt steel, Tungsten steel, ALNICO, ALNI	1	Mar-16				
Special Purpose Materials :Metals/ alloys for fuses with their properties composition & uses	1	Mar-16				
Composition and properties of soldering materials, Materials for thermocouple,	1	Mar-16				
Materials for bimetal, Super conductivity and super conducting materials application and recent trend in this field.	2	Mar-16				
revision of chapter 1 to 12	10	mar-apr16				
PRACTICALS						
Measurement of armature winding and	4	Aug-15				
Measurement of shunt field winding	4	Sep-15				
Verification of Kirchhoff's laws in D.C.	4	Sep-15				
Verification of Kirchhoff's laws in A.C.	4	Oct-15				
Determination of B-H curve of a D.C.	4	Oct-15				
Revision of practicals 1 to 5	10	Nov-Dec 15				
Measurement of power and power factor	4	Jan-16				
Determination of R and L of a choke coil	4	Jan-16				
Determination of R and C of a capacitor	4	Feb-16				
Measurement of phase and line voltage	4	Feb-16				
Measurement of power in 3-phase circuit	4	Mar-16				
Revision of practicals 1 to 10	10	mar-apr16				

GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **EE 308**

SUBJECT NAME : **Power system III**

FACULTY NAME : **RAM DAYAL RATHOR**

DESIGNATION : **LECTURER (Electrical)**

TOPIC	LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC	MONTHS IN WHICH THE TOPIC WILL BE COVERED	ACTUAL DATE OF COVERING OF THE TOPIC	REASON FOR NOT COVERING THE TOPIC IN DUE TIME	E- CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC
Load and Load Curves :Types of load	1	Aug-15			
Variation in demand, chronological load curve,Load duration curve, energy load curve	1	Aug-15			
Load factor, capacity factor, diversity factor, connected load, maximum demand, utilization factor	1	Aug-15			
Economic Aspects of Generation :Factor affecting the cost of generation	1	Aug-15			
Cost reduction by power station inter connection,calculation of cost per unit	1	Sep-15			
Incremental rate of generation and condition for economic loading	1	Sep-15			
Tariffs:Objectives of tariff,General tariff form	1	Sep-15			
types of tariff,Flat rate,Straight meter rate,Block meter rate	1	Sep-15			
Hopkinson demand tariff,Doherty demand rate,Wright demand rate	1	Sep-15			
Present tariff pattern in Rajasthan	1	Sep-15			
Power Factor Improvement :Meaning of power factor,Causes of low power factor,	1	Sep-15			
Effects of low power factor,Advantages of power factor improvement	1	Sep-15			
Methods of power factor improvement	1	Oct-15			
Location of shunt capacitors	1	Oct-15			

Combined Operation of Power Stations :	1	Oct-15				
Types and advantage of interconnection	1	Oct-15				
Base load, peak load and load allocation among different power station	1	Oct-15				
Real and reactive power control of turbo alternator	1	Oct-15				
Reactive power requirements during peak and off peak hours	1	Oct-15				
Control of Voltage and Reactive Power :Introduction,Methods of voltage control,	2	Oct-15				
Tap changing transformers	1	Nov-15				
Offload tap changing transformer	1	Nov-15				
On load tap changing transformer	1	Nov-15				
Shunt reactors,Shunt capacitors	1	Nov-15				
Series compensation,Location of series capacitors	1	Nov-15				
Protective schemes for series capacitors	1	Nov-15				
Problems associated with series capacitors	1	Nov-15				
Series capacitor versus shunt capacitor	1	Nov-15				
Synchronous phase modifiers	1	Dec-15				
Rating of a phase modifier	1	Dec-15				
Static VAr systems (SVS),Advantages and applications of SVS	1	Dec-15				
Extra High Voltages Transmission :Introduction,Need for EHV transmission,	1	Jan-15				
Use of Bundled conductors,Conductor	1	Jan-16				
	1	Jan-16				
Environmental aspects in EHV and UHV	1	Jan-16				
Radio noise from EHV lines	1	Jan-16				
HVDC Transmission :Introduction,Types of	1	Jan-16				
Advantages of DC transmission,Converter station equipment	1	Jan-16				
Ground return,Earth electrode, station earth	1	Feb-16				

HVDC systems in India	1	Feb-16				
Corona :The Phenomenon of Corona	1	Feb-16				
Disruptive critical voltage,Visual critical voltage	2	Feb-16				
	1	Feb-16				
Corona Loss,Factors and conditions affecting corona	1	Feb-16				
Raido interference due to corona,Practical considerations	1	Mar-16				
Corona in Bundled conductor	1	Mar-16				
Revision	12	mar-apr16				