

Dept.of Electrical and Computer Engineering, North South University

Course Title: Power System Protection	Course Code: EEE 462	Credit Hours: 3 credits
Prerequisite: EEE-362	Contact hours: 3 hours/week	
Course Objective: Switchgear basic information and different protector details.		

Course Contents:

Midterm (Total Mark: 20)		
Segments	Course contents	Marks
Seg-1	<p>1. INTRODUCTION TO SWITCHGEAR.</p> <p>1.1. Introduction (V.K Mehta-Pdf-387)</p> <p>1.2. Definition of Switchgear</p> <p>1.3. Essentialities of Switchgear protection + Figure 1.1 (S. Rao)</p> <p>1.4. Essential Features of Switchgear (V.K Mehta-Pdf-388)</p> <p>1.5. Switchgear Equipment (V.K Mehta-Pdf-388,389,390)</p> <p>1.6. Short Circuit (V.K Mehta-Pdf-393)</p> <p>1.6.1.1. Causes of short-circuit V.K Mehta-Pdf-394)</p> <p>1.6.1.2. Effects of short-circuit V.K Mehta-Pdf-394)</p> <p>1.6.1.3. Importance of short circuit current analysis</p> <p>2. PROTECTIVE RELAYING</p> <p>2.1. Introduction (V.K Mehta-Pdf-497)</p> <p>2.2. Protective Relays (V.K Mehta-Pdf-498)</p> <p>2.3. Functions of Protective Relaying Fundamental Requirements of Protective Relaying (V.K Mehta-Pdf-498,499,500)</p> <p>2.4. Types of Protection (V.K Mehta-Pdf-519)</p> <p>2.4.1.1. Primary Protection</p> <p>2.4.1.2. Backup Protection</p> <p>2.5. Types of Basic Relays (V.K Mehta-Pdf-519 + MTA Sheet “Protective Relaying – Art. 1.8.1-1.8.7”/ Bakshi-28-30)</p> <p>3. INSTRUMENT TRANSFORMER (“Protective Relaying – Art. 1.10 – 1.17”/ Bakshi-34-40)</p>	10
Seg-2	<p>4. ELECTROMAGNETIC ATTRACTION RELAYS</p> <p>4.1. Electromagnetic Attraction Relays classification(V.K Mehta-Pdf-500)</p>	10

	<p>4.1.1.1. Attracted Armature Type Relay + (Fig.2.5 - Bakshi –53)</p> <p>4.1.1.2. Solenoid Type Relay + (Fig.2.7 Bakshi –55)</p> <p>4.1.1.3. Balanced Beam Type Relay</p> <p>4.2. Advantages of Electromagnetic Attraction Relays (Bakshi –57-Art.2.3.4)</p> <p>4.3. Disadvantages of Electromagnetic Attraction Relays (Bakshi -57-Art.2.3.5)</p> <p>4.4. Application of Electromagnetic Attraction Relays (Bakshi –57-Art.2.3.5)</p> <p>5. INDUCTION RELAYS</p> <p>5.1.1. Mathematical Derivation of Torque Equation (V.K Mehta-Pdf-501,502)</p> <p>5.1.2. Shaded-pole type induction relay(V.K Mehta-Pdf-502)</p> <p>5.1.3. Watt-hour-meter type induction relay(V.K Mehta-Pdf-503)</p> <p>5.1.4. Induction cup type induction relay (V.K Mehta-Pdf-503)</p>	
Seg-3	<p>6. Relay Timing (V.K Mehta-Pdf-504,505)</p> <p>6.1. Instantaneous relay</p> <p>6.2. Inverse-time relay</p> <p>6.3. Definite time lag relay</p> <p>7. Terminologies Used in Protective Relaying[Bakshi-30-Art.1.9 + V.K Mehta-505 + Math-21.1(V.K.Mehta-507) +Math-2.1,2.2(Bakshi-67,68)]</p> <p>8. Functional Relay Types</p> <p>8.1. Induction Type Overcurrent Relay (non-directional) (V.K.Mehta- 508)</p> <p>8.2. Induction Type Directional Power Relay(V.K.Mehta- 509)</p> <p>8.3. Induction Type Directional Overcurrent Relay (V.K.Mehta-510)</p> <p>8.4. Thermal relay(Bakshi-75-Art.2.8)</p>	10

