	GURGAON INSTITUTE OF TECHNOLOGY & MANAGEMENT	
	Department : Electrical Engineering Session :Jan-June 2018 Branch / Sem : EE / 6TH Subject Name & Code :Power System II (EE-312-F)	
LESSON PLAN		**TEACHER : Ms. Ritu Sharma**

TEXT BOOKS:
1. Power System protection and switchgear –B.Ram, D.N.Vishvakarma : TMH.
2. Switchgear and protection - S.S.Rao : Khanna Pub.

REF. BOOKS:
1. A course in Electrical Power - Soni, Gupta and Bhatnagar - Dhanpat Rai & Sons.
2. Power System Engg: I.J. Nagrath and D.P. Kothari (TMH).
3. Power System Engineering: V. K. Mehta.

Lecture No.	Topics to be Covered
1.	**Section-A** SYMMETRICAL FAULT ANALYSIS: Transients on a transmission line
2.	short circuit of synchronous machine at no load
3.	Short circuit of synchronous on full load.
4.	SYMMETRICAL COMPONENTS: Symmetrical component transformation
5.	Symmetrical component transformation
6.	Symmetrical component transformation
7.	phase shift in star-delta transformation
8.	Sequence impedances.
9.	numerical
10.	UNSYMMETRICAL FAULT ANALYSIS: Single line to ground fault
11.	numerical
12.	line to line fault
13.	numerical
14.	Open conductor fault.

15.	numerical
16.	**SECTION- B** CIRCUIT BREAKERS: Theory of arc interruption, circuit breaker
17.	circuit breaker ratings, restriking voltage transients, current chopping
18.	duties of switch gear, automatic switch,
19.	air circuit breaker
20.	bulk oil, minimum oil, air blast
21.	SF6 CB, vacuum and DC circuit breakers.
22.	APPARATUS PROTECTION: Transformer protection, Generator protection
23.	motor protection, bus zone protection
24.	**Section-C** PROTECTIVE RELAYS: Nature and causes of faults, consequences, zone of protection, essential qualities
25.	primary and backup protections
26.	relay classification, principal types of electromagnetic relays, i.e. attracted armature
27.	Induction disc, induction cup types.
28.	RELAY APPLICATION AND CHARACTERISTICS: Over -current, instantaneous over current, IDMT, directional and differential
29.	distance relays, plain impedance, mho, reactance, offset mho type
30.	transmission line & feeder protection
31.	Relays introduction, over current, distance, pilot wire and carrier current protection, neutral grounding
32.	**Section-D** STATIC & DIGITAL RELAYS: Classification of static relays, amplitude and phase comparators
33.	block- spike and block-average comparators , rectifier type relays
34.	Introduction to digital relay: basic principles. Application of microprocessors and computers - recent Trends
35.	Travelling wave relay, relaying schemes based on microwave and optical fiber link.