

**Govt. Polytechnic Panchkula**  
**Electrical Engineering Department**  
**Lesson plan**

<b>Name of Faculty</b>				
<b>Discipline</b>			<b>Electrical Engineering</b>	
<b>Semester</b>			<b>5<sup>th</sup></b>	
<b>Subject</b>			<b>Electrical Machines-II</b>	
<b>Lesson Plan Duration</b>			<b>From October 2021</b>	
<b>Work load [Theory + Practical] Per Week</b>			<b>[05+02]</b>	
<b>Week</b>	<b>Day</b>	<b>Theory Topic/ Assignment/ Test</b>	<b>No.</b>	<b>Practical</b>
<b>1<sup>st</sup></b>	<b>1</b>	<b>Unit1: Introduction Synchronous Machines</b>	<b>1</b>	<b>Demonstration of revolving field set up by a 3-phase wound stator</b>
	<b>2</b>	<b>Constructional features of synchronous machine</b>		
	<b>3</b>	<b>Generation of three phase emf</b>		
	<b>4</b>	<b>Production of rotating magnetic field in a three phase winding</b>		
	<b>5</b>	<b>Revision/ Review of above Topics</b>		
<b>2<sup>nd</sup></b>	<b>1</b>	<b>Concept of distribution and coil span factor</b>	<b>2</b>	<b>To plot relationship between no load terminal voltage and excitation current in a synchronous generator at constant speed</b>
	<b>2</b>	<b>Drive Emf equation, synchronous speed</b>		
	<b>3</b>	<b>Armature reaction at unity, lag and lead power factor</b>		
	<b>4</b>	<b>Voltage regulation using synchronous impedance method</b>		
	<b>5</b>	<b>Revision/ Review of Topics</b>		
<b>3<sup>rd</sup></b>	<b>1</b>	<b>Need and necessary conditions of parallel operation of alternators</b>	<b>3</b>	<b>Determination of the relationship between the voltage and load current of an alternator, keeping excitation and speed</b>
	<b>2</b>	<b>Operation of synchronous machine as a motor –its starting methods</b>		
	<b>3</b>	<b>Effect of change in excitation of a synchronous motor</b>		
	<b>4</b>	<b>Concept and Cause of hunting and its prevention</b>		
	<b>5</b>	<b>Revision/ Review of above Topics</b>		
<b>4<sup>th</sup></b>	<b>1</b>	<b>Rating and cooling of synchronous machines</b>	<b>4</b>	<b>file checking</b>
	<b>2</b>	<b>Applications of synchronous machines (as an alternator, as a synchronous condenser)</b>		
	<b>3</b>	<b>Revision of important topics</b>		
	<b>4</b>	<b>Assignment / Class test</b>		
	<b>5</b>	<b>Revision/ Review of above Topics</b>		
<b>5<sup>th</sup></b>	<b>1</b>	<b>Problem solution/ test check</b>	<b>5</b>	<b>Determination of the regulation and efficiency of alternator from the open circuit and short circuit test</b>
	<b>2</b>	<b>Unit2: Introduction to Induction Motors</b>		
	<b>3</b>	<b>constructional features of squirrel cage and slip ring 3-phase induction Motors</b>		
	<b>4</b>	<b>Principle of operation, slip and its significance</b>		
	<b>5</b>	<b>Revision/ Review of above Topics</b>		
	<b>1</b>	<b>Locking of rotor and stator fields</b>		

6 <sup>th</sup>	2	Rotor resistance, inductance	6	Synchronization of polyphase alternators and load sharing
	3	Emf Equation and current relations		
	4	Relationship between copper loss and motor slip		
	5	Revision/ Review of above Topics		
7 <sup>th</sup>	1	Power flow diagram of an induction motor	7	Determination of the effect of variation of excitation on performance of a synchronous motor
	2	Factors determining the torque, Torque-slip curve, stable and unstable zones		
	3	Effect of rotor resistance upon the torque slip relationship		
	4	Double cage rotor motor and its applications		
	5	Revision/ Review of above Topics		
8 <sup>th</sup>	1	Starting of 3-phase induction motors, DOL	8	Study of ISI/BIS code for 3-phase induction motors
	2	Star-delta, auto transformer starting		
	3	Causes of low power factor of induction motors		
	4	Testing of 3-phase induction motor on no load		
	5	Revision of Unit No-01		
9 <sup>th</sup>	1	And blocked rotor test and to find efficiency	9	file checking
	2	Speed control of induction motor		
	3	Harmonics and its effects		
	4	cogging and crawling in Induction Motors		
	5	Revision of Unit No-01		
10 <sup>th</sup>	1	Revision of important topics	10	Determination of efficiency by (a) no load test and blocked rotor test on an induction motor
	2	Assignment / Class test		
	3	Problem solution/ Class Test check		
	4	Unit3: Fractional Kilo Watt (FKW) Motors		
	5	And its description		
11 <sup>th</sup>	1	Single phase induction motors	11	Determination of effect of rotor resistance on torque speed curve of an induction motor
	2	Construction characteristics and applications		
	3	Nature of field produced in single phase induction motor		
	4	Split phase induction motors		
	5	Type of Induction Motor		
12 <sup>th</sup>	1	Capacitors start and run	12	Revision
	2	Shaded pole, Reluctance start motor		
	3	Alternating current series motor and universal motors		
	4	1-phase synchronous motor Reluctance type		
	5	Brief description about Synchronous Motor		
13 <sup>th</sup>	1	Hysteresis motor	13	To study the effect of a capacitor on the single phase induction motor to reverse the direction of rotation.
	2	Revision of important topics		
	3	Assignment / Class test		
	4	Problem solution/ test check		
	5	Revision of important topics		
	1	Unit4:Special Purpose Machines		

<b>14<sup>th</sup></b>	<b>2</b>	<b>Construction and working principle of linear induction motor</b>	<b>14</b>	<b>viva-voice related to electrical machine</b>
	<b>3</b>	<b>stepper motor</b>		
	<b>4</b>	<b>Servomotor</b>		
	<b>5</b>	<b>Revision of important topics</b>		
<b>15<sup>th</sup></b>	<b>1</b>	<b>submersible motor</b>	<b>15</b>	<b>viva-voice related to electrical machine</b>
	<b>2</b>	<b>introduction to energy efficient motors</b>		
	<b>3</b>	<b>Assignment / Class test</b>		
	<b>4</b>	<b>Problem solution/ test check</b>		
	<b>5</b>	<b>Problem solution/ test check</b>		
<b>16<sup>th</sup></b>	<b>1</b>	<b>Problem solution/ test check</b>	<b>16</b>	<b>Internal Practical</b>
	<b>2</b>	<b>Revision</b>		
	<b>3</b>	<b>Revision</b>		
	<b>4</b>	<b>Revision</b>		
	<b>5</b>	<b>Revision</b>		