Lecture Plan -1

Doc. No.: DCE/0/15

Revision :00

Semester:-6th   Course Code:-EE-314-F

Subject: - CAEMD   Section: A

S. No.	Topic :- Machine Design	Time Allotted:-
1.	**Introduction** General feature and limitation of the machine electrical design, Types of machine, enclosure, heat dissipation	5 min
2	**Division of the Topic** -Introduction to electrical machine -Description of machine design -Operation of machine -types of machines -	35 min
3.	**Conclusion** Machine design and reducing the cost and improving the efficiency Of the electrical machines.	5 min
4	**Questions / Answers** **Q1**. What are the factors need to consider to design the machine? **A1**. Types of material loss less material. **Q2** types of electrical machine ? **A2**. Dc motor and generator and IM Syn motor and transformer	5min

Assignment to be given:- NIL

Reference Readings:-

1. A course in electrical machine design– A.K Sawhney
2. theory, performance and design of machine -MG Say LLBS

Lecture Plan -2

Semester:-6th   Course Code:-EE-306-F

Subject:-CAEMD   Section: A

S. No.	Topic :- Heat Dissipation and Temperature	Time Allotted:-
1.	**Introduction** Understanding the heat dissipation of the material . Selection of material based on design	5 min
2	**Division of the Topic** -machine design model -types of materials -heat dissipation -temperature	35 min
3.	**Conclusion** temperature and heat derivation of the electrical machine	5 min
4	**Questions / Answers** **Q1**..	5min

Assignment to be given:-
Assignment-I enclosed
Reference Readings:-
1. A course in electrical machine design– A.K Sawhney
2. theory, performance and design of machine -MG Say LLBS

Lecture Plan -3

Semester:-6th   Course Code:-EE-314-F

Subject:- CAEMD   Section: A

S. No.	TOPIC: Cooling cycle of the machine	Time Allotted:-
1.	**Introduction** Cooling cycle of the machine , temperature reduction Cooling media used	5 min
2	**Division of the Topic** Types of cooling cycles Temperature reduction technique Cooling media to be used Derivation.	35 min
3.	**Conclusion** Heat and temperature reduction by using different cooling system.	5 min
4	**Questions / Answers** 1 what are the cooling methods are using for machines? 2.classify the temperature reduction techniques	5min

Assignment to be given:- NIL
Reference Readings:-
   1. A course in electrical machine design– A.K Sawhney
   2. theory, performance and design of machine -MG Say LLBS

Lecture Plan -4

Semester:-6th   Course Code:-EE-314-F

Subject:-   CAEMD   Section: A

S. No.	TOPIC: conducting and insulating materials **VOLTAGE**	Time Allotted:-
1.	**Introduction** Different types of conducting insulating materials.	5 min
2	**Division of the Topic** -conducting materials super conducting materials Insulating materials . different types of materials	35 min
3.	**Conclusion** Choosing right type of conducting insulating materials .	5 min
4	**Questions / Answers** 1. Classify the conducting materials?? 2. Differentiate between conducting and super conducting materials?	5min

Assignment to be given:- NIL
Reference Readings:-
1. A course in electrical machine design– A.K Sawhney
2. theory, performance and design of machine -MG Say LLBS

Lecture Plan -5

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section: A

S. No.	TOPIC: MAGNETIC MATERIALS AND APPLICATION OF DIFFERENT TYPES OPF MATERIALS	Time Allotted:-
1.	**Introduction** Magnetic materials and application of different types of materials Design of the materials	5 min
2	**Division of the Topic** -classification of the materials -class A BC D F materials -design of the materials	35 min
3.	**Conclusion** Based on the characteristics of the materials and decide the which type of materials	5 min
4	**Questions / Answers** 1 classify classes of materials ? 2 based on what factor we classify the classes of materials?? And take a example and solve the problem	5min

Assignment to be given:- NIL

Reference Readings:-

1. A course in electrical machine design– A.K Sawhney
2. theory, performance and design of machine -MG Say LLBS

Lecture Plan -6

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section: A

S. No.	TOPIC: BASIC DESIGN AND PRINCIPLES	Time Allotted:-
1.	**Introduction** Design principle and output equation of the machines And output coefficients	5 min
2	**Division of the Topic** Equation for the out put	35 min
3.	**Conclusion** Studied the farasdays law of electromagnetism and found emf of machine	5 min
4	**Questions / Answers** 1.whats is maximum flux desnsity of machine 2.what is silica of material? Solve the one problem on flux denssity	5min

Assignment to be given:-   Assignment II given as enclosed
Reference:-
1. A course in electrical machine design– A.K Sawhney
2. theory, performance and design of machine -MG Say LLBS

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section: A

S. No. TOPIC:	SPECIFIC ENERGY AND MAGNETIC LOADING	Time Allotted:-
1.	**Introduction** Calculation of the energy based on the loading and no load of the Electrical machine. .impact the load on the calculation of the output of the machine.	5 min
2	**Division of the Topic** Magnetic loading No-load Output of the machine.	35 min
3.	**Conclusion** Based on the output calculated efficiency.	5 min
4	**Questions / Answers** 1 calculate the efficiency based on different input of machine? 2 consider the losses and solve the problem of machine?	5min

Assignment to be given:- NIL
Reference Readings:-
1. A course in electrical machine design– A.K Sawhney
2. theory, performance and design of machine -MG Say LLBS

Lecture Plan -8

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section: B

S. No.	TOPIC: TYPES OF ELECTRICAL MACHINES	Time Allotted:-
1.	**Introduction** Electrical machines its ventilations Transformer ventilation Dc machine ventilations	5 min
2	**Division of the Topic** -natuaral cooling Forced cooling	35 min
3.	**Conclusion** By applying different cooling method and to cool the machine	5 min
4	**Questions / Answers** 1 what are the cooling methods used in transformer? 2.what is the difference between distribution transformer and Power transformer**?**	5min

Assignment to be given:- NIL
Reference Readings:-
1. A course in electrical machine design– A.K Sawhney
2. theory, performance and design of machine -MG Say LLBS

Lecture Plan -9

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section: B

S. No.	TOPIC: MAGNETIC CIRCUITS	Time Allotted:-
1.	**Introduction** MMF calculation for aigun and iron parts Of electrical machines Air gap	5 min
2	**Division of the Topic** -mmf calculation Air gaps between two moving or static parts of the machine Magnetic frame	35 min
3.	**Conclusion** Mmf calculation. Based on variation gap between rotor and stator of machine	5 min
4	_____ **Questions / Answers** **1 observe the speed of the motor by variation in air gap of the motor?** **2 if we increase the gap between the rotor and stator of the machine?**	5min

Assignment to be given:-Nil

Reference Readings:- 1. A course in electrical machine design– A.K Sawhney

2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -10

Semester:-6ᵗʰ   Course Code:-EE-314-E

Subject:-CAEMD   Section: B

S. No.	TOPIC: gap contraction coefficient	Time Allotted:-
1.	**Introduction** Real and apperant flux desnsity Estimation of magnetic current Based on variation in gap observe the current and magnetic characteristic	5 min
2	**Division of the Topic** Gap contraction Coefficient Flux density	35 min
3.	**Conclusion** Due to variation in gap changes in flux density of the machine	5 min
4	**Questions / Answers** 1 define the different co efficient of the machine?	5min

Assignment to be given:-Nil

Reference Readings:- 1. A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -11

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section: B

S. No.	TOPIC: MAGNETIC CURRENT OF TRANSFORMER	Time Allotted:-
1.	**Introduction** Transformer principle and emf equation and Transformer on load and no load condition Losses in transformer	5 min
2	**Division of the Topic** -different types of transformer -types of materials using in transformer -magnetic inrush current	35 min
3.	**Conclusion** Transformer to be designed	5 min
4	**Questions / Answers** 1.Classify the transformer based on core? 2. design the transformer consider the data based on different core materials?	5min

Assignment to be given:- NIL

Reference Readings:- 1. A course in electrical machine design– A.K Sawhney

2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -12

Semester:-6ᵗʰ   Course Code:-EE-314-F

Subject:-CAEMD   Section: B

S. No.	ROTATING MACHINE AND LOAD CURRENT OF THE MACHINE	Time Allotted:-
1.	**Introduction** Rotating machine Design of the machine Load current of the machine	5 min
2	**Division of the Topic** -machine modelling Leakage flux reactance .	35 min
3.	**Conclusion** Calculation of reactance and leakage reactance Ohmic losses in winding	5 min
4	**Questions / Answers** **1. How we decide the rating of the machine?** **2. Why the losses is more in rotating in machine compare to static Electrical machine?**	5min

Assignment to be given:- NIL
Reference Readings:-
1.   A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -13

Doc. No.: DCE/0/15
Revision :00

Semester:-6th   Course Code:-EE-314-E

Subject:-CAEMD   Section: B

S. No.	TOPIC: Sequential steps involved in the design and manufacture of any product	Time Allotted:-
1.	**Introduction** Customer specification as per contract, if available, should be read and salient points of design parameters to be highlighted. Latest National/International standards applicable for this design should be referred .	5 min
2	**Division of the Topic** -specification of machine Kva and kw rating machine National and international standards	35 min
3.	**Conclusion** **Studied standard of the machines**	5 min
4	**Questions / Answers** Why the rating of the rotating of the machine is in KW??	5min

Assignment to be given:- NIL
Reference Readings:-
1.A course in electrical machine design– A.K Sawhney
2.Theory, performance and design of machine -MG Say LLBS

Lecture Plan -14

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section: B

S. No.	TOPIC: Calculation of dimensions	Time Allotted:-
1.	**Introduction** Performance of the machine Efficiency calculation	5 min
2	**Division of the Topic** -parameters, using well-proven computer programs, established with equations, scientific formulae, empirical formulae	35 min
3.	**Conclusion** Calculate dimension of the machines	5 min
4	**Questions / Answers** **Q1** calculate machine dimension of the machine based on loading 2 calculate the dimension of the machine based on no load of the machine?	5min

Assignment to be given:- NIL

Reference Readings:-

1.   A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -15

Semester:-6th   Course Code:-EE-314-E

Subject:-CAEMD   Section: B

S. No.	TOPIC: Steps to Get Optimal Design	Time Allotted:-
1.	**Introduction** Input parameters like KW, Voltage, PF, Frequency, and any parameter guaranteed	5 min
2	**Division of the Topic** -output power Voltage Power factor Frequency	35 min
3.	**Conclusion** Name plate design **Questions / Answers** Calculate the parameter of the machine?	5 min
4		5min

Assignment to be given:- NIL
Reference Readings:- 1. A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -16

Semester:-6th   Course Code:-EE-314-E

Subject:-CAEMD   Section: B

S. No.	TOPIC: DESIGN OF THE MAGNET	Time Allotted:-
1.	**Introduction** Designing of the magnet and its geometry Cross sectional view of the core Winding placed on core .	5 min
2	**Division of the Topic** -magnet Core Winding	35 min
3.	**Conclusion**	5 min
4	**Questions / Answers** **Q1 design of magnet of the machine based on load?** **2 differentiate between bar magnet and electromagnet?** .	5min

Assignment to be given:- NIL
Reference Readings:-
1.   A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -17

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section: B

S. No.	TOPIC: Important Terms Related to Armature Windings	Time Allotted:-
1.	**Introduction** Different types of winding Wave and lap winding Armature winding	5 min
2	**Division of the Topic** Lap winding Wave winding Simplex winding Duplex winding Armature winding	35 min
3.	**Conclusion** Different types of winding studied and suitable for different machines	5 min
4	**Questions / Answers**	5min

Assignment to be given:- NIL
Reference Readings:-

1.   A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -18

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section: C

S. No.	Topic :- DESIGN OF TRANSFORMER	Time Allotted:-
1.	**Introduction** Design details of the transformer	5 min
2	**Division of the Topic** - core type transformer Shell type transformer Construction of the transformer	35 min
3.	**Conclusion** Constructional view of the transformer designed	5 min
4	**Questions / Answers** **Q1** classify the transformer based on core material?	5min

Assignment to be given:-
Reference Readings:-
1.   A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -19

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section: C

S. No.	Topic :- DC MACHINES	Time Allotted:-
1.	**Introduction** Construction details of dc machine .	5 min
2	**Division of the Topic** - rotor of the machine - stator of the machine - winding of the dc machine	35 min
3.	**Conclusion** Dc machine designed maintained constant air gap	5 min
4	**Questions / Answers** . 1.what is air gap difference between of the ac and dc machine?	5min

Assignment to be given:-

Reference Readings:- 1. A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -20

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section: C

S. No.	Topic :- INDUCTION MACHINE	Time Allotted:-
1.	**Introduction** Types of rotor Cage type rotor Slip ring induction motor	5 min
2	**Division of the Topic** Single cage rotor induction motor Double cage rotor induction motor Slip ring induction motor	35 min
3.	**Conclusion** Induction motor designed	5 min
4	**Questions / Answers** **1.what is design difference between single cage and double cage of the induction Machine?**.	5min

Assignment to be given:-

Reference Readings:- 1. A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -21

Semester:-6th   Course Code:-EE-314-F

Subject:- CAEMD   Section: C

S. No.	Topic :- synchronous machine	Time Allotted:-
1.	**Introduction** Synchronous machine Generator Motor	5 min
2	**Division of the Topic** Salient pole motor Non salient pole motor Projected pole Long rotor motor	35 min
3.	**Conclusion** Synchronous motor designed	5 min
4	**Questions / Answers** Q what is the difference between salient pole and non-salient pole rotor of Synchronous machine?	5min

Assignment to be given:-Nil

Reference Readings:-
1.   A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS
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Lecture Plan -22

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section:C

S. No.	Topic: Design of Armature Winding & Core	Time Allotted:-
1.	**Introduction** Non-Salient Pole (Cylindrical Solid Rotor) Type	5 min
2	**Division of the Topic** Performance calculation of motor Cylindrical rotor construction	35 min
3.	**Conclusion** Synchronous machine designed base on cylindrical rotor	5 min
4	**Questions / Answers** How the speed of the synchronous machine maintained constant?	5min

Assignment to be given:-Nil
Reference Readings:-

Lecture Plan -23

Doc. No.: DCE/0/15
Revision :00

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section:D

S. No.	Topic:- COMPUTER AIDED DESIGN	Time Allotted:-
1.	**Introduction** Computerisation of machine design procedure	5 min
2	**Division of the Topic** Energy conversion Mechanical energy Electrical energy	35 min
3.	**Conclusion** Energy conversion from mechanical to electrical and electrical to mechanical	5 min
4	**Questions / Answers** 1. Explain energy concept in machine	5min

Assignment to be given:-Nil

Reference Readings:-
1.   A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan-24

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section:D

S. No.	Topic :- Calculation of Armature main Dimensions and flux for pole	Time Allotted:-
1.	**Introduction:-** Computer Program in MATLAB .	10 min
2	**Division of the Topic** Sequential Steps for Design of Each Part and Programming Simultaneously. Design of Rotor Computer Output Results for Complete Design	30 min
3.	**Conclusion:** designed rotor by using matlab	5 min
4	**Question / Answer** 1importance of matlab in design of the machine?	5 min

Assignment to be given:- Applications of CAD tools.

Reference Readings:- 1. A course in electrical machine design– A.K Sawhney

2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -25

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section:D

S. No.	Topic:- Electric Machine	Time Allotted:-
		10 min
2	**Introduction:** Energy conversion devices . **Division of the Topic** Electric machines have: Stationary members (stator) rotating members (rotor) Air gap which is separating stator and rotor The rotor and stator are coupled magnetically	30 min
		5 min
	Conclusion: Modelling of dc machine	
4.	**Question / Answer** .	5 min

Assignment to be given:-

Reference Readings:- 1.   A course in electrical machine design– A.K Sawhney
2. theory, performance and design of machine -MG Say LLBS

Lecture Plan -26

Semester:-6th   Course Code:-EE-314-F

Subject:- CAEMD   Section:D

S. No.	Topic:- FIELD FORM FACTOR AND FILED FORM CO EFFICEINT	Time Allotted:-
1.	**Introduction:** Dc motor output equation	5 min
2	**Division of the Topic** Pole design Pole pitch Front pitch	35 min
3.	**Conclusion**: pole pitch and front pitch designed	5 min
4	**Question / Answer** 1. Defiene the pitch factor of the dc machine ? 2 define pole pitch, and front pitch of the machine? .	5min

Assignment to be given:-NIL

1.   A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -27

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section:D

S. No.	Topic:- RATING OF THE MACHINE	Time Allotted:-
1.	**Introduction**:- Name plate details of the machine	5 min
2	**Division of the Topic** Voltage rating Speed of the machine Size of the machine	35 min
3.	**Conclusion:** design details of the machine .	5 min
4	**Question / Answer** 1. Observe the losses in rotating machine and compare it with static machine?	5min

Assignment to be given:-NIL

Reference Readings:- 1.   A course in electrical machine design– A.K Sawhney
                         2.   theory, performance and design of machine -MG Say LLBS

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Lecture Plan -28

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section:D

S. No.	Topic:- factors consider for armature winding	Time Allotted:-
1.	**Introduction**: Armature design	
2	**Division of the Topic** Design of the armature of the dc machine	35 min
3.	**Conclusion** 1. designed the armature of the machine	5 min
4	**Question / Answer** Q1 what is difference between armature of the dc and ac machine?	5min

Assignment to be given:-Nil
Reference Readings:-
1.   A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -29

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section:D

S. No.	Topic:- write the matlab program for dc machine rotor design	Time Allotted:-
1.	**Introduction** Matlab program for dc machine rotor design.	5 min
2	**Division of the Topic** Rotor geometry Core materials	35 min
3.	**Conclusion**	5 min
4	**Question / Answer**	5min

Assignment to be given:-Nil
Reference Readings:-

1.   A course in electrical machine design– A.K Sawhney
2.   theory, performance and design of machine -MG Say LLBS

Lecture Plan -30

Semester:-6th   Course Code:-EE-314-F

Subject:-CAEMD   Section:D

S. No.	Topic:- Development of Computer program	Time Allotted:-
1.	**Introduction** Development of Computer program	
2	**Division of the Topic** - Development of Computer program. performance prediction Optimization techniques and their applications to design Problems.	35 min
3.	**Conclusion**	5 min
4	**Question / Answer**	5min

Assignment to be given:-Nil
Reference Readings:-
1.A course in electrical machine design– A.K Sawhney
2.theory, performance and design of machine -MG Say LLBS