

6. Dhruvanarayana, V. V. (1993). Soil and Water Conservation Research in India. ICAR, New Delhi.
7. Goldman, S. J, Jackson K. and Bursztynsky, T. A. (1986). Erosion and Sediment Control Handbook. McGraw Hill Book Company.
8. Michael, A. M. and Ojha, T.P. (1985). Principles of Agricultural Engineering. (Vol. II). Jain brothers, New Delhi.
9. http://ecourses.iasri.res.in/e-Leaarningdownload3_new.aspx?Degree_Id=04

IV Year I - Semester

L	T	P	To	C
3	1	-	4	4

AG403 Electrical Machines and Power Utilization

Course Description & Objectives:

To study different electrical power machines and their use in various applications in agricultural operations.

Course Outcomes:

Students will be able to acquire knowledge about:

1. *Different types of circuits and their applications.*
2. *Principles and operation of transformers, DC machines and motors.*
3. *Various methods of power measurement*

Unit I: Introduction

Electro motive force, reluctance, laws of magnetic circuits, determination of ampere turns for series and parallel magnetic circuits, hysteresis and eddy current losses,

Unit II: Transformer

Transformer: principle of working, construction of single phase transformer, EMF equation, phasor diagram on load, leakage reactance, transformer on load, equivalent circuit, voltage regulation, power and energy efficiency, open circuit and short circuit tests,

Unit III: DC Machine

Principles, operation and performance of DC machine (generator and motor), EMF and torque equations, armature reaction, commutation, excitation of DC generator and their characteristics, DC motor characteristics

Unit IV: Motors

Starting of shunt and series motor, starters, speed control methods field and armature control, polyphase induction motor: construction, operation,

equivalent circuit, phasor diagram, effect of rotor resistance, torque equation, starting and speed control methods,

Unit V: Single Phase Induction Motor

Single phase induction motor: double field revolving theory, equivalent circuit, characteristics, phase split, shaded pole motors, disadvantage of low power factor and power factor improvement, various methods of single and three phase power measurement.

TEXT BOOKS:

1. Bimbhra, P.S.(1991). *Electrical Machinery*. Khanna Publishers., New Delhi.
2. Cotton, H. (1999). *Advanced Electrical Technology* (7 ed.). Wheeler Publishing.

REFERENCES:

1. Nagrath, Kothari. (2006) *Electric Machines*. Tata Mc GrawHill publishing company., New Delhi.
2. Theraja, A.K and Theraja, B.L (2002) *.A Textbook of Electrical Technology Vol.1)*. S.Chand
3. <http://nptel.ac.in/courses/108105017/>
4. <http://nptel.ac.in/courses/108106071/>

IV Year I - Semester

L	T	P	To	C
3	1	-	4	4

ME425 Refrigeration and Air Conditioning

Course Description & Objectives:

To introduce history, importance and components of mechanical engineering, concepts of unit operations and unit processes, and current scenario of refrigerants & industrial applications.

Course Outcomes:

Upon successful completion of this course, the student will be able to:

1. *understand the difference between refrigeration and air conditioning*
2. *describe the two methods of lowering the temperature of material*
3. *identify and describe the three methods of heat transfer*
4. *understand the kinds of refrigeration systems available*
5. *understand kinds of air refrigeration systems available*
6. *understand types of vapor refrigeration systems available*
7. *understand reasons of phase change of matter*