

RTM Nagpur University

B.Tech. 6th semester Electrical Engineering Subject:

Electrical Drives & Their Control (BTCHEE605T)

Syllabus - Theory

Examination Scheme: Internal Assessment – 30 marks, University Exam - 70marks

Course Objective:

This course is designed to familiarize the learners with

- Starting, speed control, braking, heating, cooling characteristics of electric motors and necessity of flywheel.
- The basics of PLC, its programming , Digital Control of Electric motors and its Application
- The motors used in Electric Traction, Electric Vehicles and its control strategies.

Course Outcomes: After completing the course, the students will be able to

CO1	Understand the concept of Electrical characteristics like starting, speed control and braking along with numerical
CO2	Relate various factors of industries with reference to PLC, its programming and Digital Control
CO3	Analyze the causes and effects of motor control used in Electric Vehicle
CO4	Acquire knowledge of various electrical drives used in industries, AC & DC contactors and work on drives used in Industries
CO5	Perceive the concept of Electric traction and their control strategies used in practice.

SYLLABUS - SUBJECT: Electrical Drives & Their Control

UNITS	CONTENTS	NO.OF HOUR
UNIT 1	<p>Characteristics of Electrical Motors : Definition, classification, speed- torque characteristics of common drive motors and their characteristics under starting, running, braking and speed control. SELECTION OF MOTOR: Power capacity for continuous and intermittent periodic duties. Flywheel Effect</p>	08
UNIT 2	<p>PLC & Digital Control : PLC, its Programming and its application in electrical drives. Brief idea about drives commonly used in industries. Digital control of electric motor. Block diagram, comparison with other methods of control</p>	08
UNIT 3	<p>Basics of Electric Vehicle (EV) : Definition of EV, Block diagram, Types of EV, Electric Motors and speed control, Motors Controllers and battery Charging.</p>	08
UNIT 4	<p>AC & DC contactors and relays: Lock out contactors, magnetic structure, operation arc interruption, contactor rating, HV contactors, control circuit for automatic starting and braking of DC motor and three phase induction motor drives. Control panel design for MCC</p>	08
UNIT 5	<p>Electric Traction Drives: Motors used in AC/DC traction, their performance and desirable characteristics, requirements and suitability of motor for traction duty. Traction motor control – control of DC traction motor. Series parallel control with numerical starting and braking of traction motor.</p>	08

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 27/07/22
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Dr. J. B. Fulzele
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TEXT BOOKS:

1. A course in Electrical Power , Soni, Gupta and Bhatnagar
2. Modern Electrical Traction , H. Pratap
3. Basic course in Electrical Drives, S. K. Pillai
4. Fundamentals of electrical Drives & Control, V.Singhal & B.R.Gupta
5. Advance Electrical Drives, Rik D Doncker, Andre Veltman, Ducco Wj Pulle
6. Electric Drives, R.S.Lodhi, D.P.Kothari
7. Electric Vehicle Technology, Prof. Sunil Pawar

Reference Book:-

1. Fundamentals of electrical Drives, G.K.Dubey
2. Electrical Drives, Vedam Subramanyam

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