



# GIET POLYTECHNIC, JAGATPUR, CUTTACK

## LESSON PLAN

|                                      |                                           |                                                                                                                                                          |
|--------------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Discipline:<br>Electrical Engg.      | Semester: 5 <sup>th</sup>                 | Name of the teaching Faculty: Amiya Ranjan Das                                                                                                           |
| Subject:<br>ET:TH-3(C)<br>EEPE301(c) | No. of days/week<br>class Allotted:<br>03 | Semester From: 01.07.2026 To: 05.11.2026<br><br>No. of weeks: 15                                                                                         |
| Week                                 | Class/Day                                 | Theory Topics                                                                                                                                            |
| 1 <sup>st</sup>                      | 1 <sup>st</sup>                           | <b>UNIT-I: Basics of Traction</b><br>o General description of Electrical Traction system in India.                                                       |
|                                      | 2 <sup>nd</sup>                           | o Advantages and Disadvantages of Electric Drive, Diesel Electric Drive, Battery Drive                                                                   |
|                                      | 3 <sup>rd</sup>                           | o Problems associated with AC traction System and remedies for it.                                                                                       |
| 2 <sup>nd</sup>                      | 1 <sup>st</sup>                           | o Voltage balance, current balance, production of harmonics, induction effects.(contd...)                                                                |
|                                      | 2 <sup>nd</sup>                           | o Voltage balance, current balance, production of harmonics, induction effects.                                                                          |
|                                      | 3 <sup>rd</sup>                           | o Metro rail system, features                                                                                                                            |
| 3 <sup>rd</sup>                      | 1 <sup>st</sup>                           | <b>UNIT-II: Power Supply Arrangements</b><br>o Constituents of supply system:-<br>o Substation: layout, list of equipment and their functions.(contd...) |
|                                      | 2 <sup>nd</sup>                           | • Substation: layout, list of equipment and their functions.                                                                                             |
|                                      | 3 <sup>rd</sup>                           | • Feeding post: list of equipment and their functions .<br>• Feeding and sectioning Arrangements .                                                       |
| 4 <sup>th</sup>                      | 1 <sup>st</sup>                           | • Sectioning and paralleling post.<br>• Sub sectioning and Paralleling post.                                                                             |
|                                      | 2 <sup>nd</sup>                           | • Sub sectioning post.<br>• Elementary section .                                                                                                         |
|                                      | 3 <sup>rd</sup>                           | o Major equipment at substation, Miscellaneous equipment at control post or Switching station.(contd...)                                                 |
| 5 <sup>th</sup>                      | 1 <sup>st</sup>                           | o Major equipment at substation, Miscellaneous equipment at control post or Switching station.                                                           |
|                                      | 2 <sup>nd</sup>                           | o Protection system for traction transformer and 25 kV centenary construction.(contd...)                                                                 |
|                                      | 3 <sup>rd</sup>                           | o Protection system for traction transformer and 25 kV centenary construction                                                                            |
| 6 <sup>th</sup>                      | 1 <sup>st</sup>                           | <b>UNIT-III: Overhead Equipment</b><br>o Different types of overhead equipment .                                                                         |
|                                      | 2 <sup>nd</sup>                           | o Pentagonal OHE Centenary Construction .                                                                                                                |
|                                      | 3 <sup>rd</sup>                           | o Different Types of Centenary according to speed Limit .                                                                                                |
|                                      | 1 <sup>st</sup>                           | o OHE Supporting Structure, Cantilever assembly diagram.(contd...)                                                                                       |



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| 7th  | 2nd | o OHE Supporting Structure, Cantilever assembly diagram .                                    |
|      | 3rd | o Overhead system- Trolley collector, Bow collector, Pantograph Collector (contd...)         |
| 8th  | 1st | o Overhead system- Trolley collector, Bow collector, Pantograph Collector.                   |
|      | 2nd | o Types and construction of pantograph .                                                     |
|      | 3rd | <b>UNIT-IV:Electric Locomotive</b>                                                           |
| 9th  | 1st | o Classification and Nomenclature of Electric Locomotive .(contd...)                         |
|      | 2nd | o Classification and Nomenclature of Electric Locomotive .                                   |
|      | 3rd | o Block diagram of AC locomotive.<br>o Power Circuit of AC Locomotive.                       |
| 10th | 1st | o Equipment (List and Function only) used in auxiliary circuit of AC Locomotive .(contd...)  |
|      | 2nd | o Equipment (List and Function only) used in auxiliary circuit of AC Locomotive .            |
|      | 3rd | o Loco bogie classification according to wheel arrangements.                                 |
| 11th | 1st | o Maintenance of AC systems.                                                                 |
|      | 2nd | <b>UNIT-V:Traction Motors and Train Lighting</b>                                             |
|      | 3rd | o Desirable characteristics of traction motor.                                               |
| 12th | 1st | o Types of motors used for traction with their characteristics and features .                |
|      | 2nd | o Control of motors used for traction and methods to control .                               |
|      | 3rd | o Requirements of braking, types of braking .                                                |
| 13th | 1st | o Electric braking, Regenerative braking .                                                   |
|      | 2nd | o Systems of train lighting, Single battery, double battery parallel block system.(contd...) |
|      | 3rd | o Systems of train lighting, Single battery, double battery parallel block system.           |
| 14th | 1st | <b>UNIT-VI:Signalling and Supervisory Control</b>                                            |
|      | 2nd | o Requirements of signalling systems .                                                       |
|      | 3rd | o Types of signals, track circuits .                                                         |
| 15th | 1st | o Advantages of remote control .                                                             |
|      | 2nd | o Systems of remote control, equipment and network .                                         |
|      | 3rd | o Metro rail-supply systems, advantages, schemes in India.(contd...)                         |
|      |     | o Metro rail-supply systems, advantages, schemes in India .                                  |

*J.Dm*  
24.06.26  
Signature of faculty

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