**VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN**
**(Autonomous Institution, Affiliated to Anna University, Chennai)**
# DEPARTMENT OF EEE

## LESSON PLAN

**Sub code & Name: U14EE736 SOLID STATE DRIVES**

**Year / Sem : IV-YEAR A&B / VIII Sem**

| UNIT – I ( INTRODUCTION ) | | | | |
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| **S.NO** | **Topics to be covered** | **Duration in Min** | **Teaching Aid** | **Reff Book** |
| 1 | Introduction to solid state drives | 45 | BB | T1,T2,R1 |
| 2 | various components-power converters | 45 | BB, Animation videos | T1,T2,R1, You Tube |
| 3 | motors | 45 | BB, Animation videos | T1,T2,R1, You Tube |
| 4 | motors | 45 | BB | T1,T2,R1 |
| 5 | loads | 45 | BB | T1,T2,R1 |
| 6 | coupling mechanisms | 45 | | |
| 7 | Stability of drive | 45 | BB, Animation videos | T1,T2,R1, You Tube |
| 8 | Stability of drive | 45 | BB, Animation videos | T1,T2,R1, You Tube |
| 9 | Revision | 45 | BB | |
| **UNIT –II ( CONVERTER FED DC MOTOR DRIVES )** | | | | |
| 1 | Modeling of d.c.motor drives | 45 | BB | T1,T2,R1 |
| 2 | Transfer function | 45 | BB, Animation videos | T1,T2,R1, You Tube |
| 3 | state-space models | 45 | BB | T2,R1 |
| 4 | Experimental determination of drive parameters | 45 | BB, Animation videos | T1,T2,R1, You Tube |
| 5 | Speed control using ac to dc converters | 45 | | |
| 6 | Speed control using ac to dc converters | 45 | BB | T2,R1, |
| 7 | Input performance parameters | 45 | BB, Animation videos | T1,T2,R1, You Tube |
| 8 | Speed reversal schemes | 45 | BB | T2,R1 |
| 9 | Revision | 45 | BB | |

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| **UNIT –III ( CHOPPER FED DC MOTOR DRIVES )** | | | | |
| 1 | Chopper fed d.c.motor drives | 45 | BB | T1,T2,R1 |
| 2 | Four quadrant operation | 45 | BB | T1,T2,R1 |
| 3 | Input filters design | 45 | BB | T1,T2,R1 |
| 4 | Input filters design | 45 | BB | T1, R1 |
| 5 | Dynamic braking with dc chopper | 45 | BB, Animation videos | T1,T2,R1, You Tube |
| 6 | Type-c chopper fed regenerative braking | 45 | BB, Animation videos | T1,T2,R1, You Tube |
| 7 | Type-c chopper fed regenerative braking | 45 | BB, Animation videos | T1,T2,R1, You Tube |
| 8 | Operation with non-receptive lines | 45 | BB | T1,T2,R1 |
| 9 | Revision | 45 | BB | |
| **UNIT – IV ( POWER CONVERTERS )** | | | | |
| 1 | Introduction to Power converters | 45 | PPT | T1, R1 |
| 2 | Power converters for induction motor speed control | 45 | BB, Animation videos | T1, R1 |
| 3 | Harmonic behavior of induction motors | 45 | BB, Animation videos | T1,T2,R1, You Tube |
| 4 | Harmonic currents using per phase equivalent | 45 | PPT | T1, R1 |
| 5 | Harmonic torques using per phase equivalent circuit | 45 | PPT | T1, R1 |
| 6 | Harmonic torques using per phase equivalent circuit | 45 | PPT | T1, R1 |
| 7 | Stator voltage control schemes slip power recovery scheme. | 45 | BB | T1, R1 |
| 8 | Stator voltage control schemes slip power recovery scheme. | 45 | BB | T1, R1 |
| 9 | Revision | 45 | BB | |
| **UNIT – V ( INDUCTION MOTOR MODELING )** | | | | |
| 1 | State-space modeling of induction motors. | 45 | PPT | T1, R1 |
| 2 | Voltage source-Inverter fed operation | 45 | BB, Animation videos | T1,T2,R1, You Tube |

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| 3 | Voltage source-Inverter fed operation | 45 | PPT | T1, R1 |
| 4 | Inverter fed operation | 45 | BB | T1, R1 |
| 5 | Inverter fed operation | 45 | BB | T1, R1 |
| 6 | Field oriented control schemes | 45 | PPT | T1, R1 |
| 7 | Current source | 45 | PPT | T1, R1 |
| 8 | Inverter drives. Principle of vector control | 45 | BB | T1, R1 |
| 9 | Revision | 45 | PPT | |

**REFERENCES**


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|---|---|
| **1** | G.K. Dubey, 'Fundamentals of Electrical Drives', Narosa Publishing house, 2nd edition, 2008. |
| **2** | R.Krishnan, 'Electric Motor Drives-Modeling, Analysis, and Control', Pearson Education Publishers, 1st edition, 2003. |
| **3** | B.K.Bose, 'Modern Power Electronics and AC drives', Pearson Education Publications, 2nd edition 2005. |
| **S.No** | |
| **1** | P.C.Sen, 'Thyristor DC Drives' John Wiley& Sons Publishers, New York, 2008 |
| **2** | T. Wildi, 'Electrical Machines Drives and Power Systems', Pearson Education Publications, 6th edition, 2004. |