

Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

CE5331 - Metro systems and engineering

Credit Distribution: C:9 L:3 T:0 P:0 E:0 O:6 TH:0

Course Type: Theory

Description: To give the students an overview of Metro Systems and Engineering in the areas of Civil, Mechanical and Electrical Engineering

Course Content: CIVIL ENGINEERING- Elevated and underground Stations; Viaduct spans and bridges; Underground tunnels; Depots; Commercial and buildings; Traffic integration, multimodal transfers and pedestrian facilities; Environmental and social safeguards; Track systems-permanent way. ELECTRONICS AND COMMUNICATION ENGINEERING- Signalling systems; Automatic fare collection; Operation Control centre (OCC and BCC); SCADA and other control systems; Platform Screen Doors. MECHANICAL & TV + AC: Rolling stock, vehicle dynamics and structure; Tunnel Ventilation systems; Air conditioning for stations and buildings; Fire control systems; Lifts and Escalators ELECTRICAL: OHE, Traction Power; Substations- TSS and ASS; Power SCADA; Standby and Back-up systems; Green buildings, Carbon credits and clear air mechanics.

Text Books: NIL

Reference Books

- ASHRAE. ASHRAE Handbook on HVAC Applications, Chapter A13 - Enclosed Vehicular Facilities. ASHRAE Inc., Atlanta, USA, 2003. 2
- .Davies, F. H. Electric power and traction, Kessinger Publishing, LLC, 2007.
- Dover, A. T., Electric Traction, Sir Isaac Pitman Publishers, 1922.
- Handschin, E. Real Time Control of Electric Power Systems, Elsevier, 1972
- Handschin, E. Energy Management Systems, Springer Verlag, 1990
- John D Mc Donald, Electric Power Substation Engineering, CRC press, 2001.
- Papacostas, C.S and Prevedouros, P.D, Transportation Engineering and Planning, Third Edition, PHI Learning Private Ltd., 2010.
- Savelescu S, Computerized Operation of Electric Power Systems, Elsevier, 1978.
- Stuart, A.B. (2010). SCADA: Supervisory Control and Data Acquisition, 4th Edition, ISA.
- Vuchic, V. R. "Urban Transit: Operations, Planning and Economics", John Wiley and Sons, 2005.
- Vuchic, V. R. Urban Transit Systems and Technology", John Wiley and Sons, 2007.
- Wood, A. J and Wollenberg, B. F, Power Generation Operation and Control, 2nd Edition John Wiley and Sons, 2003.

Prerequisite: NIL