**PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY**

**Department of Civil Engineering**

Faculty Name: - Ravinder Kumar Subject Name: - Metro System Engineering Year/Semester: - 4th /7th Subject Code: - OE-407A

**LESSON PLAN**

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| Sr. No. | Lecture No. | Topics To Be Covered |
| 1 | L-1 | **UNIT-I,** **Basic Understanding:** General Overview of Metro Systems |
| 2 | L-2 | Need for Metros; routing studies. |
| 3 | L-3 | Basic Planning and Financials. |
| 4 | L-4 | **UNIT-II** Civil Engineering Overview and construction methods. |
| 5 | L-5 | Elevated and underground Stations. |
| 6 | L-6 | Viaduct spans and bridges. |
| 7 | L-7 | Underground tunnels; Depots. |
| 8 | L-8 | Commercial and Service buildings. |
| 9 | L-9 | Initial Surveys & Investigations. |
| 10 | L-10 | Basics of Construction Planning & Management. |
| 11 | L-11 | Construction Quality & Safety Systems. |
| 12 | L-12 | Traffic integration. |
| 13 | L-13 | Multimodal transfers and pedestrian facilities |
| 14 | L-14 | Environmental and social safeguards. |
| 15 | L-15 | Track systems, permanent way. |
| 16 | L-16 | Facilities Management. |
| 17 | L-17 | **UNIT-III** Electronics And Communication Engineering Signaling systems. |
| 18 | L-18 | Automatic fare collection. |
| 19 | L-19 | Operation Control Centre. |
| 20 | L-20 | SCADA and other control systems. |
| 21 | L-21 | Platform Screen Doors. |
| 22 | L-22 | **UNIT-IV**  Mechanical &TVS, AC. |
| 23 | L-23 | Rolling stock, vehicle dynamics and structure. |
| 24 | L-24 | Tunnel Ventilation systems. |
| 25 | L-25 | Air conditioning for stations and buildings. |
| 26 | L-26 | Fire control systems. |
| 27 | L-27 | Lifts and Escalators. |
| 28 | L-28 | ELECTRICAL: OHE, Traction Power. |
| 29 | L-29 | Substations TSS and ASS. |
| 30 | L-30 | Power SCADA; Standby and Backup systems. |

RAVINDER KUMAR

(COURSE INCHARGE)