INTELLIGENT TRANSPORTATION SYSTEMS

(Open Elective – I)

Course Code: 20CE11P3	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

Pre-requisites: None

Course Outcomes:

At the end of the course, student will be able to:

CO1: Explain sensor technologies and data collection of ITS
CO2: Explain about ATIS, ATMS and congestion pricing.
CO3: Explain about APTS, CVO, new technology and ETC
CO4: Discuss about regional architecture, integration of infrastructure and operational planning
CO5: Summarizes about ITS applications, various factors and emerging issues

UNIT-I: **(10 Lectures)**

FUNDAMENTALS OF ITS:

Definition & Historical background of ITS, Classification of ITS, ITS user services, ITS Data collection techniques – Detectors - Automatic Vehicle Location (AVL) - GIS, Sensor technologies.

Learning outcomes:

1. Explain Intelligent Transportation Systems. (L2)
2. Explain the components of ITS. (L2)
3. Describe the Detectors used for data collection. (L2)

UNIT-II **(10 Lectures)**

ATIS & ATMS:

Advanced Traveller Information Systems (ATIS) - business models, Advanced Traffic Management Systems (ATMS), congestion pricing, HOT lanes - example deployments.

Learning outcomes:

1. Explain the requirements of ATMS (L2)
2. Describe about congestion pricing (L2)
3. Discuss about the advantages of HOT lanes (L2)

UNIT-III **(10 Lectures)**

APTS & ETC:

Fleet-oriented ITS services, Advanced Public Transportation Systems (APTS), BRTS, Commercial Vehicle Operations (CVO) and Intermodal Freight, electronic toll collection (ETC), Advanced Vehicle Control Systems (AVCS), Advanced Rural Transportation Systems (ARTS), dedicated short range communication and standards.

Learning outcomes:

1. Explain about the APTS (L2)
2. Describe about commercial vehicle operations (L2)
3. Explain about Electronic Toll Collection (L2)

UNIT-IV **(10 Lectures)**

ITS PLANNING & ARCHITECTURE:

ITS Planning, Regional architecture, Physical architecture, ITS Standards and Evaluation Methods, ITS and security, ITS and safety, Institutional Issues of ITS.

Learning outcomes:

1. Explain the regional architecture of ITS. (L2)
2. Differentiate ITS standards. (L2)
3. Explain various institutional issues of ITS. (L2)

UNIT-V **(10 Lectures)**

ITS APPLICATIONS:

Automated Highway Systems (AHS), ITS Programs in the World, Case Studies: applications in bus transport, metro and highways, Overview of ITS implementation in developed and developing countries, Advanced ITS.

Learning outcomes:

1. Explain the goals of Automated Highway Systems. (L2)
2. Explain the future of ITS. (L2)
3. Describe about international ITS Programs. (L2)

TEXT BOOKS:

1. Ghosh, S., Lee, T.S.,"Intelligent Transportation Systems: New Principles and Architectures", CRC Press, 2000.
2. Mashrur A. Chowdhury, and Adel Sadek, "Fundamentals of Intelligent TransportationSystems Planning", Artech House, Inc., 2003.

REFERENCES:

1. Sussman, J.M.,"Perspectives on Intelligent Transportation Systems", Springer, Berlin, 2010.
2. R.P Roess, E.S. Prassas, W.R. McShane.,"Traffic Engineering", Pearson Educational International, 3rdEdition, 2004.