INTELLIGENT TRANSPORTATION SYSTEM
(SYLLABUS)

Course Code	23CE2701C	Year	IV	Semester	I
Course Category	OE- III	Branch	CIVIL	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites Courses	Surveying, Highway Engineering
Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Objectives:

After completing this course, students will be able to:

- Understand the fundamentals and components of Intelligent Transportation Systems (ITS).
- Apply sensing, communication, and data technologies in transportation systems.
- Analyze ITS functional areas and system architectures.
- Evaluate ITS applications for efficient, safe, and sustainable transportation.

Course Outcomes:

Course will enable the student to:

CO	Statement	Blooms level
CO 1	**Explain** fundamentals, components, and benefits of Intelligent Transportation Systems.	**L2**
CO 2	**Apply** sensor technologies and data acquisition methods in traffic management systems.	**L3**
CO 3	**Analyze** ITS functional areas and user services in transportation systems.	**L4**
CO 4	**Analyze** ITS architecture, planning, and system evaluation methods.	**L4**
CO 5	**Apply** ITS applications for traffic management, safety, and sustainable mobility.	**L3**

Course Articulation Matrix:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	-	1	1	-	-	-	-	2	1
CO2	3	3	2	1	2	2	2	-	-	-	-	3	2
CO3	3	3	2	2	1	2	2	-	-	-	-	3	2
CO4	3	3	2	2	2	2	2	-	-	-	-	3	2
CO5	3	3	2	2	1	3	3	1	-	-	-	3	2

(1 = Low, 2 = Medium, 3 = High)

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Syllabus

Unit No	Content	Mapped COs
I	Fundamentals of ITS: Definition of ITS s, the historical context of ITS from both public policy and market economic perspectives, Types of ITS; Historical Background, Benefits of ITS.	CO1
II	Sensor technologies and Data requirements of ITS: Importance of telecommunications in the ITS system, Information Management, Traffic Management Centers (TMC). Application of sensors to Traffic management; Traffic flow sensor technologies; Transponders and Communication systems; Data fusion at traffic management centers; Sensor plan and specification requirements; Elements of Vehicle Location and Route Navigation and Guidance concepts; ITS Data collection techniques – Detectors, Automatic Vehicle Location (AVL), Automatic Vehicle Identification (AVI), GIS, video data collection.	CO2
III	ITS functional areas – Advanced Traffic Management systems (ATMS), Advanced Trav Information systems (ATIS), Commercial Vehicle Operations (CVO), Advanced Vehicle Control systems (AVCS), Advanced Public Transportation systems (APTS), Advanced Rural Transportation systems (ARTS) ITS User Needs and Services – Travel and Traffic management, Public Transportation Management, Electronic Payment, Commercial Vehicle Operations, Emergency Management, Advanced Vehicle safety systems, Information Management.	CO3
IV	ITS Architecture – Regional and Project ITS architecture; Concept of operations; ITS Models and Evaluation Methods; Planning and human factor issues for ITS, Case studies on deployment planning and system design and operation; ITS and safety, ITS and security, ITS as a technology deployment program, research, development and business models, ITS planning	CO4
V	ITS applications: Traffic and incident management systems; ITS and sustainable mobility, travel demand management, electronic toll collection, ITS and road-pricing.; Transportation network operations; commercial vehicle operations and intermodal freight; public transportation applications; ITS and regional strategic transportation planning, including regional architectures: ITS and changing transportation institutions Automated Highway Systems- Vehicles in Platoons – Integration of Automated Highway Systems. ITS Programs in the World – Overview of ITS implementations in developed countries, ITS in developing countries	CO5

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Learning Resource(s)
Text Book(s)
1. 1. Fundamentals of intelligent transportation systems planning By Mashrur A. Chowdhury, Adel Wadid Sadek 2. ITS Hand Book 2000: Recommendations for World Road Association (PIARC) by 3. Kan Paul Chen, John Miles.
Reference Book(s)
1. Sussman, J. M., Perspective on ITS, Artech House Publishers, 2005. 2. National ITS Architecture Documentation, US Department of Transportation, 2007
e- Resources & Other digital material
1. http://digital-library.theiet.org/content/journals/iet-its 2. http://digital-library.theiet.org/content/journals/iet-its 3. http://www.tandfonline.com/toc/gits20/current 4. https://www.its.dot.gov/history/pdf/HistoryofITS_book.pdf

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