Global Positioning Systems

Course Code	20EC4703A	**Year**	IV	**Semester**	I
Course Category	Professional Elective -V	**Branch**	ECE	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Satellite communication
Continuous Internal Evaluation:	30	**Semester End Evaluation:**	70	**Total Marks:**	100

Course Outcomes	
Upon successful completion of the course, the student will be able to	
CO1	Understand the characteristics of GPS signals and transceivers (L2).
CO2	Illustrate different types of GPS errors (L3)
CO3	Analyse various standard formats of GPS (L4)
CO4	Differentiate GPS applications (L4)

Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)
Note: 1- Weak correlation 2-Medium correlation 3-Strong correlation
* - Average value indicates course correlation strength with mapped PO

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2									2		2		
CO2	3									3				
CO3		2								2				
CO4		3					3			3		3		3
Avg.	**3**	**3**					**3**			**3**		**3**		**3**

Syllabus		
Unit No.	**Contents**	Mapped CO
1	**Introduction to GPS:** Overview of GPS, GPS segments, GPS satellite generations, current GPS satellite constellation, control sites.	CO1, CO4
2	**GPS Details:** GPS signal structure, GPS modernization, types of GPS receivers, time systems, pseudo range measurements, Carrier-phase measurements and cycle slips.	CO1, CO2
3	**GPS errors and Biases:** GPS ephemeris errors, Selective availability, satellite receiver and clock error, multipath error, Ionospheric error, tropospheric error	CO1, CO2
4	**GPS standard formats:** RINEX, NGS-SP3, RTCM SC-104 and NMEA 0183.	CO1, CO3
5	**GPS Applications:** GPS for utilities industry, forestry and natural resources, precision farming.	CO1, CO4

Learning Resources
Text Books
1. Ahmed EI-Rabbany, Introduction to GPS the Global Positioning System: Artech House. 2. Christopher J. Hegarty (eds), Elliott D. Kaplan- Understanding GPS: Principles and Applications, 2nd Ed.- Artech House
Reference Books
1. James Bao-Yen Tsui, Fundamentals of Global Positioning System Receivers: A Software Approach, John Wiley & Sons, Inc,2000
e- Resources
1. https://ocw.mit.edu/courses/12-540-principles-of-the-global-positioning-system-spring-2012/