

1.	Title of the course	Foundations of Metamaterials and Plasmonics
2.	Course number	EE562L
3.	Status of the course	Elective
4.	Structure of credits	3-0-0-3
5.	Offered to	PG
6.	New course/modification to	New
7.	To be offered by	Department of Electrical Engineering
8.	To take effect from	January 2023
9.	Prerequisite	CoT
10.	Whether approved by the Department	Yes
11.	Course Objective(s): To impart the use of electromagnetic metamaterials and plasmonics for RF and microwave engineering and it particularly covers engineered transmission-line or periodic structures possessing tailored electromagnetic properties.	
12.	Course Content: Metamaterials: introduction to metamaterials (MTMs), theory of Left-Handed Metamaterials (LH-MTMs), transmission line theory of MTMs, two-dimensional MTMs, guided-wave applications of MTMs, radiated-wave applications of MTMs, future MTMs; Plasmonics: general concepts of plasmonics, Surface Plasmon Polariton (SPP) at a flat metal interface, general characteristics of SPPs, dispersion equations of SPPs at a flat interface, dispersion equations of conducting cylindrical waveguides, principles of SPPs excitations, application of plasmonic phenomena, examples, and problems.	
13.	Textbook(s): 1. Caloz C and Ithoh T, <i>Electromagnetic Metamaterials: Transmission Line Theory and Microwave Applications</i> , 1st Edition, Wiley-Interscience (2006). 2. Nickelson L, <i>Electromagnetic Theory and Plasmonics for Engineers</i> , 1st Edition, Springer (2019).	
14.	Reference(s): 1. Capolino F, <i>Theory and Phenomena of Metamaterials</i> , 1st Edition, CRC Press (2009). 2. Maier S A, <i>Plasmonics: Fundamentals and Applications</i> , 1st Edition, Springer (2007).	