

## ECE3032: AUTOSAR and Infotainment

Programme: B.Tech/M.Tech.  
Course: Elective

Year: 3<sup>rd</sup> and 4<sup>th</sup>  
Credits: 3

Semester: 6/8  
Hours: 40

### Course Context and Overview (100 words):

This course aims at providing a thorough understanding of standardized software architecture for automotive electronic control units and infotainment system, its design requirements, Software components, various layers and automotive and consumer electronic communication systems. This course also helps students to understand the functional domains, time critical requirements, distributed systems and their integration using hardware and software techniques.

**Prerequisites Courses:** Nil

### Course outcomes (COs):

<b>On completion of this course, the students will have the ability to:</b>
CO1: To establish the need of AUTOSAR in the automotive industry.
CO2: To understand the layered architecture in AUTOSAR.
CO3: To understand BSW Methodologies and integration.
CO4: To understand various communication mechanisms in AUTOSAR.
CO5: To understand various infotainment systems in a vehicle.

### Course Topics:

Topics	Lecture Hours	
<b>UNIT - I</b>		
<b>1. AUTOSAR Fundamentals:</b>		3
1.1 Evolution of AUTOSAR – Motivations and Objectives	1	
1.2 AUTOSAR consortium, Specification and BWS	2	
<b>UNIT - II</b>		
<b>2. AUTOSAR layered Architecture:</b>		
2.1 AUTOSAR Basic software, Details on the various layers , Details on the stacks, Virtual Function Bus (VFB) Concept, Overview of AUTOSAR Methodology , Tools and Technologies for AUTOSAR	6	10
2.2 AUTOSAR Application Software Component, AUTOSAR Run Time Environment (RTE), MCAL, IO HW Abstraction Layer, Partial Networking, Multicore, J1939 Overview, AUTOSAR Ethernet, AUTOSAR E2E Overview and AUTOSAR XCP	4	
<b>UNIT - III</b>		
<b>3. Methodology of AUTOSAR and Communication in AUTOSAR:</b>		
3.1 CAN Communication, Application Layer and RTE, intra and inter ECU communication,	4	8
3.2 Client-Server Communication, Sender-Receiver Communication, CAN	4	

Driver, Overview of Diagnostics Event and Communication Manager (ComM).		
<b>UNIT – IV</b>		
<b>4. BSW Development and Integration:</b>		8
4.1 BSW Constituents, Interfaces:	4	
4.2 Complex device drivers and BSW module configuration and AUTOSAR Integration	4	
<b>UNIT –V</b>		
<b>5. Infotainment and Communication Systems in Automobiles:</b>		
5.1 Introduction to In Vehicle Infotainment, Use of operating systems in IVI , GENIVI Alliance, tuner's and multimedia, Navigation, Media types and Architectures and design patterns.	6	11
5.2 Automotive & Consumer Electronic Communication Systems, Blue tooth-Pairing, HFp,A2Dp, Pan, PBAP, MOST networks, AVB and Tethering.	5	

**Textbook references (IEEE format):****Text Book:**1 [www.autosar.org](http://www.autosar.org)2. Ronald K. Jurgen, "*Infotainment systems*", SAE International, 2007**Evaluation Methods:** Evaluation criteria will be shared by the concerned course instructor.**Prepared By: Abhishek Sharma****Last Update: 11<sup>th</sup> Jan 2016**