Descriptions of Courses

PD501 Digital Electronic Circuits for Vehicles

The objective of this course is to deliver fundamental concepts and design methods on digital circuits and computer systems, focusing on vehicular electronics. Starting from the concepts of combinational and sequential logics and their implementation methods, we cover how the computer system works and how to approach a complex system systematically by partitioning it into two parts, data-path and control circuitry. In addition, advanced techniques such as pipelining and memory hierarchy will be introduced.

PD502 Vehicle Dynamics and Control

The purpose of the course is to understand the basics of power transmission mechanism and steering, braking and suspension systems as well as mechanics between tire and various road surfaces. Two commercial softwares, Carsim and Simulink, will be taught to enhance the understanding of the dynamics of vehicle with and without various active chassis controls. Also, vehicle dynamics control algorithms are studied to enhance vehicle longitudinal, lateral, vertical, yaw and roll dynamics.

PD503 Analog Intergrated Circuits

Introduction of circuit design using Bipolar and CMOS technologies

PD511 Automobile Embedded System Programming

This lecture Covers the basic embedded system programming which includes the principles of operating systems, kernel programming, device driver programming (character devices, block devices, and interrupt handling)

PD512 Automotive Power Electronics Systems

This course deals with the basic principles and operations of power semiconductor devices, DC-DC converters, and PWM inverters. It also deals with DC drives and AC drives for various applications, i.e., automobiles, elevators, and cranes, etc.

PD531 Electric vehicle control system

This course covers the subjects of dealing with the real world problems associated with applying control theories to automotive systems that have the unique design limits in cost and robustness as well as performance. The first half of the course introduces the operation principles and the modeling of automotive control system. The second half covers introducing several control design methods followed by controller design case studies.

PD532 Smart Vehicle Dynamics

The vehicle dynamics course is currently taught here is seldom used in the development process of automotive and tire companies. In order to overcome this difficulty, practical vehicle dynamics has been developed in Hankook Tire, and furthermore it is improved based on smart concept. Physical phenomena and various testing data are explained through mechanism studies and mathematical equations.

PD631 NVH of Environment-friendly Vehicles

Fundamental knowledge on vehicle noise, vibration, and harshness (NVH) will be studied. The topics on the design and the passive/active measure techniques will be covered: Characteristics of sources, human response, identification of sources and paths, analysis of vibro-acoustics fields, and control elements.

PD651 Electric Vehicle Propulsion System Engineering & Experiment

This course is mainly to enhance understanding on the transportation and vehicle technology. Focused on the electric powertrain system applied to the future electric vehicle. The course will include the experiment and project

work.

PD652 Electric Vehicle Powertrain Engineering

This course covers the vehicular technology of electric powertrain, which includes the environmental impact, electric and hybrid-electric, wireless in-motion charging vehicular technology and their systems, and fuel cell technology, in addition to the current IC-engine technology. It will also cover the core technology of the electric vehicle system, such as the energy storage system, the electric propulsion system and the incorporation of the smart grid technology with the electric vehicle as a major future transportation system.