

# Automobile Engineering Development 2

for Syllabus Number

1L302

Special Subjects  
Elective 2 credit

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## 1. Course Description

Students will learn the overall structure and parts structure of the vehicle, the configuration and functions of various systems as components of the vehicle, and the driving performance and safety performance of the vehicle through Vehicle Development Engineering 1 and 2. Students will also learn about the relationship between drivers and cars.

In addition to lectures, students will deepen their understanding through exercises such as performance calculations for vehicle development, using the knowledge gained in specialized subject learning such as material mechanics, mechanical mechanics, and automatic control.

This class is conducted by faculty members who have practical experience in research and development on driving performance and safety performance of automobiles. Therefore, in the class, the actual experience and the on-site issues are also used as the subject. Students can acquire the knowledge, skill and behavior for DP2 to DP5.

## 2. Course Objectives

Students study driving stability, braking performance, and collision safety technology in Automobile Engineering for Development 1, and learn driving performance, preventive safety technology, environmentally friendly technology, and ergonomics in Automobile Engineering for Development 2. Students will deepen their understanding of cars, acquire practical skills, and develop their engineering sense as engineers by solving exercises through group work in addition to the usual lecture format. Students will gain knowledge and skills in automotive development and will be able to discuss future mobility.

## 3. Grading Policy

Evaluate based on reports and exercise results (100%).

## 4. Textbook and Reference

Textbook

Textbook『Automobile Engineering(the second edition)』;Kenji Higuchi et al, Tokyo Denki University Publishing Breau

『Automobile Engineering for Easy Understanding』;Kenji Higuchi et al, Nisshin Publishing Co., Ltd.

『Heat Engine Engineering』;Toshiaki Ochi et al, Korona Publishing Co., Ltd.

『Base of Automobile Engineering』;JSAE

## 5. Requirements(Assignments)

Check the scope of the next lecture in the syllabus, and read the materials and textbooks posted on LMS (1hr). In addition, after the class, read the textbooks, notebooks describing the contents of the lectures, and the materials posted on the LMS to deepen your understanding of the class learned and submit reports and assignments (1hr).

Lecture content is subject to change depending on progress.

## 6. Note

## 7. Schedule

- [1] Automotive safety technology
- [2] Vehicle motion dynamics (longitudinal motion)
- [3] Anti-Lock Brake System (ABS)
- [4] Vehicle motion dynamics (lateral motion)  
Lane Keeping System (LKS)
- [5] Electronic Stability Control (ESC)
- [6] Running Resistance and Power Performance
- [7] Automobile Performance Diagram and Gear Ratio
- [8] Climbing and Acceleration Performance and Coasting Ability
- [9] Task①;Calculation of Running Speed and Driving Force
- [10] Task②;Calculation of Gear Ratio
- [11] Practice;Comparison of Maximum Speed and Climbing Performance by changing Engine Output(Torque)---by Car Simulation
- [12] The Human Biological System
- [13] Comfortability of Driver and Passenger; Driving Position, Field of Vision and Ride
- [14] Human-Machine Interface and Driver's Model
- [15] Practice;Comparison between Response Performance of the Human Reaction Time and Automobile---by Car Simulation