

# Automobile Development 1

## Engineering

for Syllabus Number

1L301

Special Subjects  
Elective 2 credit

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### 1. Course Description

In this course, using the knowledge of special subjects such as thermodynamics, material dynamics, mechanical mechanics, fluid dynamics, etc. necessary for the development of automobiles, you will acquire basic knowledge for designing automobiles. In addition, practice and assignments are carried out based on group work and communication skills are acquired. In this course, you will acquire knowledge and techniques on Diploma Policy 2,4,5.

### 2. Course Objectives

- Students can explain the special subjects required for the design of the car.
- Through group work, students can solve the assignments necessary for the design of automobiles.

### 3. Grading Policy

Grades will be evaluated by intermediate assignment (60%), final assignment (40%).

### 4. Textbook and Reference

Textbook

Textbook: None.

Reference: 「Understandable automotive engineering」, Kenji Higuchi, etc. Nissin Publishing, ISBN:978-4817301383.

### 5. Requirements(Assignments)

We will take attendance every time. Attendance of 2/3 or more is required to acquire the unit of lecture.

### 6. Note

### 7. Schedule

- |      |   |
|------|---|
| [1]  | Overview of performance and functional design of automobiles and components |
| [2]  | Vehicle dynamics 1 : Basics of vehicle dynamics                             |
| [3]  | Vehicle dynamics 2 : Tire dynamics  |
| [4]  | Vehicle dynamics 3 : Tire dynamics  |
| [5]  | Practical training : Calculation of vehicle dynamics                        |
| [6]  | Intermediate assignment : Calculation of vehicle dynamics                   |
| [7]  | Vehicle dynamics 4 : Steering and vehicle motion                            |
| [8]  | Vehicle dynamics 5 : Steering and rolling motion of the vehicle             |
| [9]  | Vehicle dynamics 6 : Pivoting motion of the vehicle                         |
| [10] | Practical training : Calculation of vehicle dynamics                        |
| [11] | Intermediate assignment : Calculation of vehicle dynamics                   |
| [12] | Crash safety 1 : Real world accident and vehicle collision performance      |
| [13] | Crash safety 2 : Collision performance and occupant injury                  |
| [14] | Crash safety 3 : Occupant safety  |
| [15] | Final assignment, summary   |