

# Structure of electrical system and power train system for automobiles

Syllabus Number

1L201

Basic Major Subjects

Elective Requisites 2 credit

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## 1. Course Description

The following contents will be learned.

(1)Frequency characteristics of analog and digital signals, functions of measuring equipment and handling in evaluation tests.

(2)Functions, principles, structure and operation of electrical equipment for automobiles.

(3)Function, principle, structure and operation of power train system for automobiles.

In this lesson, knowledge, techniques, and attitudes regarding DP2 and DP3 will be acquired. Lessons are primarily lecture-style, but pair work will be carried out as appropriate according to the context of each lesson.

## 2. Course Objectives

Students can apply them to specific cases to concerning functions, principles, structures and operations in power train system for automobiles, and electrical equipment for automobiles.

## 3. Grading Policy

Your grade in the class will be decided on the evaluate with 80% of the result of the final exam and 20% of the result of the report on the assignment. An explanation will be given after the end of the final exam.

## 4. Textbook and Reference

Textbook

Textbook editorial committee of the Japan Automobile Service Promotion Association(Supervised by the Ministry of Land, Infrastructure, Transport and Tourism Road Transport Bureau) Third grade automobile chassis Japan Automobile Service Promotion Association (JASPA)

Textbook editorial committee of the Japan Automobile Maintenance Colleges Association (Recommended by the Ministry of Land, Infrastructure, Transport and Tourism Road Transport Bureau) Electric component structure Japan Automobile Maintenance Colleges Association (JAMCA)

## 5. Requirements(Assignments)

(1) As preparations for next lesson, please check the meaning of the proper noun and the contents of the relationship shown in the contents of the lesson, and come to the class. (90 minutes)

(2) As a review, please solve exercises applied to the items instructed during the lesson, so that you can cope with works in pair as appropriate in the next lesson. (90 minutes)

## 6. Note

The subjects you need to take in advance are Principle of Electricity and Introduction to Mechatronics. If you have not taken any subjects, it is necessary to understand the contents of both subjects as a preparatory study and start the class.

## 7. Schedule

- [1] AC coupling, DC coupling, superposition and frequency characteristics in an oscilloscope and a function generator.
- [2] Introduction to starting equipment, and exercises in pairs.
- [3] Function, structure and operation of starting equipment.
- [4] Introduction to charging equipment, and exercises in pairs.
- [5] Function, structure and operation of charging equipment.
- [6] Introduction to ignition equipment, and exercises in pairs.
- [7] Function, structure and operation of ignition equipment.
- [8] Introduction to manual transmission and clutch and differential gear of power train system for automobiles, and exercises in pairs.
- [9] Function, structure and operation of manual transmission of power train system for automobiles.
- [10] Function, structure and operation of clutch of power train system for automobiles.
- [11] Function, structure and operation of differential gear of power train system for automobiles.
- [12] Introduction to storage battery for automobiles, and functions and structures and operations, and exercises in pairs.
- [13] Introduction to windshield wiper for automobiles, and functions and structures and operations.
- [14] Introduction to Controller Area Network (CAN) for automobiles.
- [15] Introduction to steering equipment for automobiles.