

# Exercises in Aerospace Engineering2

Syllabus Number

2F303

Basic Major Subjects

Requisites 1 credit

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## 1. Course Description

In this course, students will work through exercises after a lecture given by the teacher. The contents in this course are basic and important things in the curriculum of Aerospace Engineering Department. Students are required to attend all the classes and to hand in the answer sheets of all exercises. Students are expected to acquire the knowledge and techniques of DP1 and DP2.

## 2. Course Objectives

Important contents to be learned in this course are:

- (1) Fundamentals on differentials and integrals, differential equations, and statistics
- (2) English exercise: TOEIC questions
- (3) Fluid dynamics: non-compressible and compressible
- (4) Outline of rocket engineering: basics on rocket engines, design for high reliability
- (5) Design of aircraft structures: fracture mode, strength and design of shear joints.

The main objective is that students to acquire basic academic skills and abilities helpful in meeting real-world requirements and in passing various exams for qualifications, graduate schools and employment. In each content outlined above, the objective is to understand fundamentals and to be able to solve basic problems.

## 3. Grading Policy

Grading policy is based on exercise answers submitted at each class (100%). After submission, the answers are explained by the teacher. When a student did not attend a class, he/she should make contact with the teacher and receive instructions for exercise. The grading mark of each class is summed up to the total mark of this course. When the number of attendance and that of answer submission of a student are less than two-thirds of the number of classes, and when the total mark is not in the "pass" range, the student is "not qualified".

## 4. Textbook and Reference

### Textbook

Textbooks for this course are not specified. The schedule of the course is shown before the beginning of the semester. Students are required to bring appropriate textbooks, reference books and/or notebooks to the class that have been studied and are related to the contents to be learned. At the class, in most cases, students will receive hand-out materials.

### Reference

none

## 5. Requirements(Assignments)

Submission of answer sheets is the most important. Students who were absent from a class should make contact with the teacher to receive instructions.

## 6. Note

In this course, students will brush up the basics of aerospace engineering and other subjects such as mathematics and English.

## 7. Schedule

- (1) Fundamentals on differentials and integrals, (Prof. N. Yoshitani)
- (2) Differential equations for a heating process (Prof. N. Yoshitani)
- (3) Fundamentals on statistics and probabilities (Prof. N. Yoshitani)
- (4) How to study English, TOEIC questions (Prof. N. Yoshitani)
- (5) Incompressible Fluid 1 (Manometer, Pitot tube) (Assoc. Prof. M. Kawamura)
- (6) Incompressible Fluid 2 (Water Jet, Laminar Flow and Turbulent Flow) (Assoc. Prof. M. Kawamura)
- (7) Incompressible Fluid 3 (Air Drag, Wind Tunnel Test) (Assoc. Prof. M. Kawamura)
- (8) Compressible Fluid (Rayleigh Pitot-tube Formula) (Assoc. Prof. M. Kawamura)
- (9) Elements of rocket engineering 1 (rocket engineering in general) (Prof. H. Manako)
- (10) Elements of liquid-propellant rocket engine engineering 1 (engine1) (Prof. H. Manako)
- (11) Elements of liquid-propellant rocket engine engineering 2 (engine2) (Prof. H. Manako)
- (12) Elements of liquid-propellant rocket engine engineering 3 (high reliability design) (Prof. H. Manako)
- (13) Aircraft structural design 1 (Fracture mode and strength of shear joint) (Prof. T. Hiramoto)
- (14) Aircraft structure design 2 (Design of shear joint) (Prof. T. Hiramoto)
- (15) Review and supplementary lectures or exercises (all teachers above)