

System Engineering2

Syllabus Number

2C305

Special Subjects

Elective 2 credit

NAKAMIYA. Masaki

1. Course Description

In this lecture, the students will understand the reliability and safety of systems and learn the process of failure analysis, the method of analyzing and predicting reliability based on statistics, and analytical methods such as FMEA and FTA for design phase.

2. Course Objectives

The objectives of the lecture are to understand the basic idea of reliability engineering and to acquire the overview of technical methods for reliability evaluation.

- (1) To understand the significance of reliability in mechanical design
- (2) To understand the concept of reliability evaluation
- (3) To understand statistical analysis method using reliability data
- (4) To understand and utilize design methods to be implemented at design time

3. Grading Policy

Groupwork: 20%, Quizzes: 80%

4. Textbook and Reference

Textbook

There is no specific textbook. The necessary materials will be distributed for each lecture.

Reference

H. Makabe Introduction to Reliability Engineering, New edition,

ISBN978-4542503489 Japanese Standards Association

K. Tanaka Introduction Reliability,

ISBN978-4817192936 JUSE Press

Y. Fukui Reliability Engineering, 2nd edition,

ISBN978-4627665729 Morikita Publishing

5. Requirements(Assignments)

6. Note

7. Schedule

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| [1] | Systems engineering and Reliability engineering |
| [2] | Reliability |
| [3] | Maintainability |
| [4] | Dependability |
| [5] | Probability and Statistics |
| [6] | Probability distribution function and Reliability Function |
| [7] | Lifetime distribution and Failure rate |
| [8] | Exponential distribution |
| [9] | Weibull distribution |
| [10] | Failure analysis |
| [11] | Failure Mode Effect Analysis (FMEA) |
| [12] | Fault Tree Analysis (FTA) |
| [13] | Reliability testing |
| [14] | Reliability design |
| [15] | Reliability engineering in aerospace industry |