Mathematical Logic

Syllabus Number 4B103
Basic Major Subjects
Requisites 2 credit
WATANABE, Ryuji

1. Course Description

This course covers basic mathematics necessary in the following studies of computer science. The items are as follows: Set, mapping, relation, propositional logic, and predicate logic.

All lessons from the first to the 15th are based on self-learning given on the LMS.

This subject is related to the clause 1 of the diploma policy of the Department of Information Science Correspondence Course.

2. Course Objectives

This course aims to improve the basic knowledge of mathematics for computer scientists and engineers and to enhance students' logical thinking power by working on the practice exercises.

3. Grading Policy

The final examination will be evaluated. The acceptance line is the rate of 60% in the final examination.

It is required to answer all the quizzes given on the LMS and to take the rate of 60% in all the quizzes before taking the final examination.

4. Textbook and Reference

Textbook

Course materials are given on the LMS

Reference

F.Hazama “Fundamentals of Logic and Algebra” Baifukan (2003) in Japanese. (ISBN 4-563-00335-2)

S.Toda "Techniques of Logical Analyses for Information Science"
Baifukan (2007) in Japanese. (ISBN 987-4-563-01565-7)

5. Requirements(Assignments)

Answering all the quizzes prepared on the LMS is required before taking the final examination. Also, answering the practice exercises prepared on the LMS as the homework assignments is required.

Preparation of the sets and proposition on a high school level is highly recommended.

6. Note

It is prohibited for students to refer the textbook and notebook in the final examination.

7. Schedule

[1] Set : Definition and expression of set, Operation of set
[2] Set : Law of operation of set, Direct product
[3] Set : Practice
[4] Mapping : Definition of mapping , Epimorphism and injection, Inverse mapping, Composite mapping
[5] Mapping : Practice
[6] Relation : Definition and expression of relation, Composition and Inverse relation, Union
[7] Relation : Law of relation, Equivalence relation and equivalence class, Order relation
[8] Relation : Practice
[9] Propositional logic : Definition of proposition, Truth value and propositional variables, Logical operation
[10] Propositional logic : Propositional logical expression, Law of logical operation
[11] Propositional logic : Inference, Proof and technique of proof
[12] Propositional logic : Practice
[13] Predicate logic : Predicate logic, Predicate, F unction
[14] Predicate logic : Quantifier, Predicate logical expression, Law of predicate logical operation
[15] Predicate logic : Practice