

## Simulation Aided Mathematical Sciences

2 units (selection)

Hitoshi Imai · PROFESSOR / PLANNING AND DESIGN SYSTEMS ENGINEERING FOR INFRASTRUCTURES, CIVIL AND ENVIRONMENTAL ENGINEERING, INTELLIGENT STRUCTURES AND MECHANICS SYSTEMS ENGINEERING

Toshiki Takeuchi · PROFESSOR / PLANNING AND DESIGN SYSTEMS ENGINEERING FOR INFRASTRUCTURES, CIVIL AND ENVIRONMENTAL ENGINEERING, INTELLIGENT STRUCTURES AND MECHANICS SYSTEMS ENGINEERING

**Target** This class provides the basic technology for advanced numerical simulation.

**Outline** Basic technology for advanced numerical simulation is introduced.

**Style** Lecture

**Keyword** *numerical simulation, advanced*

**Fundamental Lecture** “**Numerical Analysis**”(1.0)

**Relational Lecture** “**Methods for analysis of mathematical phenomena**”(0.5),  
“**Advanced Computational Science**”(0.5)

**Requirement** Students have to understand basic mathematics of undergraduate-level.

**Notice** 授業を受ける際には、2時間の授業時間毎に2時間の予習と2時間の復習をしたうえで授業を受けることが、授業の理解と単位取得のために必要である。

**Goal** To understand principle of Infinite-Precision Numerical Simulation.

**Schedule**

1. Introduction of computer science
2. Multiple precision arithmetic 1
3. Multiple precision arithmetic 2
4. Iteration method 1
5. Iteration method 2
6. Parallel computing 1
7. Parallel computing 2
8. Spectral method 1
9. Spectral method 2
10. Infinite-Precision Numerical Simulation 1
11. Infinite-Precision Numerical Simulation 2
12. Numerical simulation of free boundary problem 1
13. Numerical simulation of free boundary problem 2
14. Numerical simulation of inverse problem 1
15. Numerical simulation of inverse problem 2

**Evaluation Criteria** Assignments count 100%.

**Contents** <http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216690>

**Student** Able to be taken by only specified class(es)

**Contact**

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