

## レーザー分光学特論

2 units (selection)

Yoshihiro Deguchi · PROFESSOR / MECHANICAL SYSTEMS, MECHANICAL ENGINEERING, INTELLIGENT STRUCTURES AND MECHANICS SYSTEMS ENGINEERING

**Target** This class introduces a new technology of advanced heat transfer and fluid mechanics that can be used for determining the optimal design and operating conditions of nuclear and geothermal power plants and also chemical plant.

**Outline** Fundamental concepts of multiphase mixtures, Modeling flow-pattern transitions, Gas-liquid two-phase flow under microgravity, Film formation in annular flow, Flooding phenomena, Two-phase flow in micro-channel

**Style** Lecture

**Keyword** *fundamental concepts of multiphase mixtures, film formation in annular flow, flooding phenomena*

**Relational Lecture** “**Thermal Energy Control**”(0.5), “**Energy and Environment Engineering**”(0.5), “**Fluid Energy Control**”(0.5)

**Requirement** Students are required to have a good understanding of undergraduate-level heat transfer engineering, thermodynamics, hydrodynamics and related subjects.

**Goal** To understand the outline of the transport phenomena in multiphase fluids

**Schedule**

1. Fundamental concepts of multiphase flow
2. Flow pattern map
3. Pressure drop, Void fraction
4. Bubble flow
5. Slug flow, Froth flow
6. Annular flow, Mist flow
7. Film formation in annular flow( No.1)
8. Film formation in annular flow( No.2)
9. Gas-liquid two-phase flow under microgravity(No.1)
10. Gas-liquid two-phase flow under microgravity(No.2)
11. Flooding phenomena(No.1)
12. Flooding phenomena(No.2)
13. Flooding phenomena(No.3)
14. Two-phase flow in micro-channel(No.1)
15. Two-phase flow in micro-channel(No.2)
16. Discussion on multiphase fluids transport

**Textbook** To be introduced in the class

**Reference** To be introduced in the class.

**Contents** <http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216656>

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

**Contact**

⇒ Teacher of course

**Note** 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。