

Advanced Device Processing

2 units (selection)

Yoshiki Naoi · ASSOCIATE PROFESSOR / MATERIAL AND DEVICE SCIENCE, ELECTRICAL AND ELECTRONIC ENGINEERING, SYSTEMS INNOVATION ENGINEERING

Target This course will cover topics related to device processing engineering and science, in semiconductor and dielectric devices.

Outline Basic subjects such as physical chemistry, vacuum engineering, surface science, crystal growth technology and measurement methods for device evaluations will be lectured.

Style Lecture

Keyword *device processing, surface physics and chemistry, vacuum engineering*

Fundamental Lecture “**Advanced Theory of Semiconductors**”(1.0), “**Advanced Theory of Integrated Circuits**”(1.0), “**Advanced Theory of Electron Devices**”(1.0)

Relational Lecture “**Advanced Theory of Electrical and Electronic Materials**”(0.5)

Requirement なし.

Notice なし.

Goal To understand the physics of the device processing technology.

Schedule

1. Semiconductor and devices.
2. Property of vacuum
3. Production of vacuum
4. Pressure measurement
5. Interaction of atoms and molecules with surface
6. Vapor pressure, application to crystal growth using vacuum technology
7. Physisorption and chemisorption
8. Plasma etching
9. Chemical etching and Physical etching
10. Physics of diffraction
11. Electron optics
12. Electron spectroscopy
13. Scanning Electron Microscopy
14. Transmission Electron Microscopy
15. Atomic Force Microscopy
16. Examination

Evaluation Criteria Problem Sets: 50%, Paper: 50%

Textbook none - references will be cited during lectures

Reference S. M. Sze, Physics of Semiconductor Devices, Second Edition (John Wiley & Sons, 1981).

Contents <http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216776>

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

Contact

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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。