Print Close Hokkaido University Syllabus Course Title Physics and Mathematics for Electrical Engineering Subtitle Instructor (Institution) KOGA Takaaki (Faculty of Information Science and Technology) Other Instructors (Institution) KOGA Takaaki (Faculty of Information Science and Technology) Open To Other Faculties / Course Type OK Schools 2nd Semester (Winter Semester Course Number Year 2021 215030 Term) Number of Type of Class Year of Eligible Students Lecture 2 Credits Eligible Department / Other Information Class Numbering Code GIST\_EI 5001 Major Category Code Major Category Title GIST\_EI Graduate School of Information Science and Technology (Electronics for Informatics) Level Code Level Specialized Subjects (basics) in graduate level (Master's Course and Professional Course), Inter-5 Graduate School Classes Middle Category Middle Category Title Code 0 Solid State Physics and Material Engineering Small Category Code Small Category Title 0 Quantum Physics of Materials Language Type Classes are in English. Course list by the instructor with practical experiences

mathematics, classical mechanics, quantum mechanics, statistical mechanics, special theory of relativity

## Course Objectives

In this class, we will learn basic physics and mathematics necessary for electrical engineering. Topics include mathematics, classical mechanics, quantum mechanics, statistical mechanics and special theory of relativity. Partial set of these topics are selected each year as described in syllabus prior to the lectures of every year. This class is useful for students in other scientific and engineering fields than electrical engineering as well.

## Course Goals

This year, students will understand basics of quantum mechanics.

#### Course Schedule

We will read "Quantum Mechanics: The Theoretical Minimum" https://www.amazon.co.jp/-/en/gp/product/B010EUUWX0/ 1. Systems and Experiments

- 2. Quantum States
- 3. Principles of Quantum Mechanics
- 4. Time and Change
- 5. Uncertainty and Time Dependence
- 6. Combining Systems: Entanglement
- 7. More on Entanglement
- 8. Particles and Waves
- 9. Particle Dynamics
- 10.The Harmonic Oscillator

# Homework

Students are required to read the text book prior to the lecture.

# Grading System

In-class discussions including quizzes and homework 60% and final paper (report) 40%.

Practical experience and utilization for classes

Condition of tasking the subject

#### Textbooks

Quantum Mechanics: The Theoretical Minimum / Susskind and Friedman, ISBN:9780465062904

Reading List



Additional Information



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