

3. 電気電子情報工学系 Electrical, Electronics and Computer Engineering Field			EEC-F5
授業科目名 Course Title	電気物性工学 Electrics Engineering	単位数 Credit	2
担当教員 Instructor	YAMAMOTO Kohji, SHIOJIMA Kenji, KAWATO Sakae, MAKINO Takayuki, ASUBAR JOEL TACLA, IMABAYASHI Hiroki 山本 晃司、塩島 謙次、川戸 栄、牧野 哲征、 アスバル ジョエル タクラ、今林 弘毅	開講学期 Semester	秋学期 AUTUMN SEMESTER
キーワード Keywords	Crystal structure, semiconductor, electromagnetic waves	曜日/時限 Day & Time	

授業概要 Course summary	
結晶格子、金属-半導体界面、半導体デバイス、物質の電磁波（光）の伝搬、半導体キャリア輸送を理解する。 This course deals with crystal lattices, metal/semiconductor interfaces, absorption and amplification of electromagnetic waves (light), semiconductor devices, thermodynamics carrier transport in semiconductors.	
到達目標 Course goal	
To understand crystal properties in solid, electrical properties of metal/semiconductor interfaces, absorption and amplification of electromagnetic waves (light), semiconductor materials, thermodynamics, and carrier transport in semiconductors.	
授業内容 Course description	
<ol style="list-style-type: none"> 1. Symmetry operation 2. Lattice 3. Crystal system 4. Electrical properties of metal/semiconductor interfaces 5. Fabrication process of metal/semiconductor interfaces 6. Characterization techniques of metal/semiconductor interfaces 7. Thermodynamics 8. Statistical mechanics 9. Mathematics of electromagnetic waves 10. Dispersion and group velocity 11. Quantum theory in semiconductors 12. Band theory 13. Conduction mechanism in semiconductors 14. Materials for semiconductor devices 15. Applications of semiconductor thin films 	
準備学習（予習・復習）等 Preparation / Review	

Those who take this course must have in-depth understanding mathematic calculations, energy band diagrams, wave equations, electromagnetics.
授業形式 Class style
ゼミナール方式 Seminar
成績評価の方法・基準 Method of evaluation
レポート、テスト Report and Examination
教科書・参考書等 Textbook and material
Photonics, Amnon Yariv, Pochi Yeh, Oxford University Press
受講要件・予備知識 Prerequisite
ベクトル解析、半導体工学、電磁気学、電磁波工学 vector analysis, semiconductor engineering, electromagnetism, electromagnetic wave engineering
その他の注意事項 Note