

科目ナンバリング									
授業科目名 <英訳>		Photo-Energy Conversion-E2 Photo-Energy Conversion-E2			担当者所属 職名・氏名		工学研究科 講師 PARK , Jaehong		
群	自然科学科目群			分野(分類)	化学(発展)			使用言語	英語
旧群	B群	単位数	2単位	週コマ数	1コマ	授業形態	講義 (対面授業科目)		
開講年度・ 開講期	2025・前期		曜時限	火4		配当学年	主として1回生	対象学生	理系向
[授業の概要・目的]									
Course overview: We will discuss basic principles as well as various approaches of photo-energy conversion									
[到達目標]									
1. Course overview global energy problem and overview of photo-energy conversion 2. Semiconductors electrons and holes in semiconductors, Fermi energy, electrochemical potential, work function, charge generation and recombination, radiative and nonradiative recombination 3. Basic structure of solar cells basic mechanisms, pn-junction, heterojunction, Dye solar cell, organic solar cell 4. Alternative Solar Energy Conversion Conversion of thermal radiation into chemical energy, Conversion of chemical energy into electrical energy									
[授業計画と内容]									
Course overview,Background & Basics week 1,2 Semiconductors week 3-7 (1st quiz at wk 5 (from the contents upto week 4)) Basic structure of solar cells week 8-12(2nd quiz at wk 9 (from the contents between week 5 and week 8)) Alternative Solar Energy Conversion week 13-15(3rd quiz at wk 13 (from the contents between week 9 and week 12))									
[履修要件]									
特になし									
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Photo-Energy Conversion-E2(2)

【成績評価の方法・観点】

Quizzes: There will be three quizzes (May/9, Jun/6, Jul/4). The sum of 3-quiz grade will count 30% towards the final grade.

Grades: presentation (40%), 3 quizzes ($30\% = 3 \times 10\%$), 5 homeworks ($25\% = 5 \times 5\%$), attendance and class participation (5%)

【教科書】

使用しない

【参考書等】

(参考書)

Arno H. M. Smets, Klaus Jager, Olindo Isabella, Rene Van Swaaij, Miro Zeman, 『Solar Energy : The Physics and Engineering of Photovoltaic Conversion, Technologies and Systems』 (Uit Cambridge Ltd.) ISBN:9781906860325

Peter Wurfel, 『Physics of Solar Cells, 2nd ed. 2009』 (Wiley-VCH publisher)

Jenny Nelson, 『Physics of Solar Cells, 2nd ed. 2003』 (Imperial College Press)

【授業外学修（予習・復習）等】

Homework: During the semester, you will have five homework assignments and the sum of 5 grades , will count 25% towards the final grade. Problem sets of homework will be announced at the classes. Only legible and intelligible answers will be considered, and otherwise, you will lose some or all credits for the problem. No late homework turn-in will be accepted, unless the late return is excused.

【その他（オフィスアワー等）】

Office hour Location and Time:Katsura campus, A4-205, appointment by email

Office hours are thought as an opportunity for you to clarify your understanding of the material. I encourage student to use this opportunity, but I expect you have already tried to study the problems yourself for a few hours.

【主要授業科目（学部・学科名）】