מכון ויצמן למדע
WEIZMANN INSTITUTE OF SCIENCE

Feinberg Graduate School

Course Identification

Title: Molecular Photonics and Basics of Solar Energy Conversion
Code: 20142511

Lecturers and Teaching Assistants

Lecturer(s): Prof. Boris Rybtchinski
Teaching Assistants: Dr. Haim Weissmann

Course Schedule and Location

Year: 2014
Semester: First Semester
Day & Time & Location: Thursday, 0915-1100, Kimmelman, Dov Elad Rm
First Lecture: 31/10/2013
No. of planned sessions: 13

Field of Study, Course Type and Credit Points

Chemical Sciences; Elective; 2.00 points

Prerequisites

No

Restrictions

Number of students: No

Language of Instruction

English

Registration

Registration by: 10/11/2013

Attendance

Obligatory

Grade Type

Numerical (out of 100)

Grade Breakdown (in %)

Attendance / participation:
Weekly Assignments: 30%
Interim exam/assignment:
Seminar presentation:
Final Exam/assignment: 70%

Estimated Course Workload

Number of hours an ordinary student is expected to spend weekly on independent study,homework etc. related to the course:

3

Reading List

N/A

Syllabus

The course will cover basic photophysics and photochemistry of organic molecules (with the emphasis on energy and electron transfer), as well as introductory material on solar energy conversion.

Interaction of organic molecules with light. Absorption and emission of light by organic molecules. Properties of the excited states of organic molecules. Singlet and triplet states. Emission of light by molecules. Excimers and exciplexes.

Excitation energy transfer: Forster and Dexter mechanisms.

Photoinduced electron transfer (PET) in organic systems. Thermodynamic aspects: excitation energies and. redox potentials. Marcus theory of electron transfer. Reorganization energies, inverted region. Electronic coupling, distance dependence in organic systems.

Interaction of metal and semiconductor nanoparticles with light - overview.

Solar energy conversion. Natural photosynthesis - structure/function relationships, energy and electron transfer mechanisms, light-driven catalysis. Chemical systems for solar energy conversion - organic solar cells and artificial photosynthesis.

Learning Outcomes

Upon successful completion of this course students should be able to:
[1] have knowledge of molecular photonics, photoinduced energy and electron transfer; basics of nanophotonics and solar energy conversion

Website

N/A

Comments

N/A

Exam

Date	13/02/2014
Location	FGS, Rm B
Time	0900-1200
Registration Last Date	11/02/2014
Remarks	N/A

Updates

N/A

Course Rating

The year the course was taught last	2011
Number of students who answered the questonnaire	25
Number of students who took the course for credits	25

General	Rating
The rating is on a 5-point scale (1=really bad 2=not too good 3=reasonable to good 4=very good 5=excellent)	
Selection of topics covered in the course	4.12
Background material	3.65
Organization of the course	3.64
Practicality of excercises	4.52
Adequacy of assignments	3.84
Fairness of grading	-
Level of difficulty (1=too easy 2=quite easy 3=reasonable 4=difficult 5=extremly difficult)	3.28
In comparison to other FGS courses (1=the worst course 2=many courses are better 3=average 4=few courses are better 5=the best course)	3.48

Lecturers	Rating
Teaching ability of the lecturers (1=really bad 2=not too good 3=reasonable to good 4=very good 5=excellent)	
Prof. Boris Rybtchinski	3.44