

Course Schedule of TIGP Program

Semester: Fall, 2008

Course: Molecular Spectroscopy 分子光譜

Time: 9:10~12:00 am, Monday

Room:311 IAMS

Elective, credit: 3

Course No.: TIGP728100

Date	lecturer	Date	lecturer
9/15	Prof. Chi-Kung Ni	11/10	Prof. Wen-Bih Tzeng
9/22	Prof. Chi-Kung Ni	11/17	Prof. Shang-Bin Liu
9/29	Prof. Wen-Bih Tzeng	11/24	Prof. Shang-Bin Liu
10/06	Prof. Wen-Bih Tzeng	12/01	Prof. Shang-Bin Liu
10/13	Prof. Wen-Bih Tzeng	12/08	Prof. Shang-Bin Liu
10/20	Prof. Wen-Bih Tzeng	12/15	Prof. Shang-Bin Liu
10/27	Prof. Wen-Bih Tzeng	12/22	Prof. Huan-Cheng Chang
11/03	Prof. Wen-Bih Tzeng	12/29	Prof. Huan-Cheng Chang

Speaker	Part 1 (Week 1-2) Prof. Chi-Kung Ni 倪其焜教授
Class Outline	Review of group theory 1. point group 2. Application of group theory in molecular vibration 3. Application of group theory in molecular orbitals 4. Application of group theory in chemical reactivity
Textbook	Lecture notes

Speaker	Part 2 (Week 3-9) Prof. Wen-Bih Tzeng 曾文碧教授
Class Outline	1. Rotational spectroscopy 2. Vibrational spectroscopy 3. Electronic spectroscopy

Introduction	<ol style="list-style-type: none"> 1. (a) Linear, Symmetric Rotor, Spherical Rotor, and Asymmetric Rotor Molecules, (b) Rotational Infrared, Millimeter Wave, and Microwave Spectra, (c) Rotational Raman Spectroscopy, (d) Structure Determination from Rotational Constants 2. (a) Infrared Spectra, (b) Raman Spectra, (c) Vibrational Selection Rules, (d) Vibration-Rotation Spectroscopy, (e) Anharmonicity 3. (a) Molecular Orbitals, (b) Classification of Electronic States, (c) Electronic and Vibronic Selection Rules, (d) Chromophores, (e) Vibrational Coarse Structure
Grading	1 quiz and 1 term paper
Textbook	Lecture notes

Speaker	Part 3 (Week 10-14) Prof. Shang-Bin Liu 劉尚斌教授
Class Outline	Introduction to NMR and ESR spectroscopy
Introduction	<ol style="list-style-type: none"> 1. Background and History of NMR & ESR Spectroscopy 2. Fundamental NMR: Classical Mechanics Perspectives 3. Fundamental NMR: Quantum Mechanics Perspectives 4. Solid-State NMR: Techniques and Applications
Grading	Home works (30%) Two take home exams (70%)
Textbook	Lecture notes

Speaker	Part 4 (Week 15-week16) Prof. Huan-Cheng Chang 張煥正教授
Class Outline	Spectroscopy of condensed matter
Textbook	Lecture notes