

SYLLABUS

Course:	CHEM 352 (Quantum Chemistry, 4 units, online class)
Prerequisites:	CHEM351; PHYS 226 or 220B
Lecturer:	Dr. Jussi Eloranta
E-mail:	Jussi.Eloranta@csun.edu OR eloranta@aa6kj.hopto.org
Office:	NA
Office hours:	By email at any time.
Formal meeting times:	Tue, Thu 7:30 am – 9:15 am. 4 hours / week of lectures.
Exams:	1st exam (weight 50 %) and 2nd exam (weight 50 %)
Content:	Quantum mechanics, quantum chemistry, optical spectroscopy, magnetic resonance spectroscopy
Course material:	http://aa6kj.hopto.org/eloranta_lab/CHEM352/
Homework:	Mandatory
Optional Course material:	Physical Chemistry by P. W. Atkins and J. de Paula, Physical Chemistry by Silbey, Alberty and Bawendi

1. Course contents

1. Introduction to quantum mechanics
2. Quantum mechanics of atoms
3. Quantum mechanics of molecules
4. Group theory
5. Optical spectroscopy
6. Electronic spectroscopy (optical spectroscopy continued)
7. Magnetic resonance spectroscopy

2. Schedule (spring 2021)

Week #	Topic	Starting week	Note pages
1	Introduction	Jan 25	1 - 17
1	Introduction		18 - 31
2	Introduction	Feb 1	32 - 48
2	Introduction		49 - 65
3	Introduction	Feb 8	66 - 81
3	Introduction		82 - 85
3	QM of atoms		86 - 98
4	QM of atoms	Feb 15	99 - 116
4	QM of atoms		117 - 126
5	QM of atoms	Feb 22	127 - 136
5	QM of atoms		137 - 150
6	QM of molecules	Mar 1	151 - 172
6	QM of molecules		173 - 188
7	QM of molecules	Mar 8	189 - 197
1 - 7	1st exam	Date: Mar 11	1 - 197
-	Spring break	Mar 15 - 21	—
8	Symmetry	Mar 22	198 - 215
8	Symmetry		216 - 235
9	Symmetry	Mar 29	236 - 251
9	Optical spectroscopy		252 - 270
10	Optical spectroscopy	Apr 5	271 - 289
10	Optical spectroscopy		290 - 305
11	Optical spectroscopy	Apr 12	306 - 319
11	Optical spectroscopy		320 - 329
12	Electronic spectroscopy	Apr 19	330 - 345
12	Electronic spectroscopy		346 - 366
13	Magnetic resonance spectroscopy	Apr 26	367 - 382
13	Magnetic resonance spectroscopy		383 - 388
14	2nd exam	Date: May 3	198 - 388

Note: There is no final exam on the date indicated on Solar.

3. Homework

Mandatory (no extra credit) homework assignments are provided on the course web page. Homework is due whenever we finish the corresponding chapter. Return photos of your work via email.

4. Examinations

Additional material is allowed in the examinations (including lecture notes, textbooks, programmable calculators, etc.). Each of the two exams is maximum of 100 pts. A *tentative* grading scale is as follows:

<u>Grade</u>	<u>Combined score</u>
A	180.0 – 200.0 points
B	140.0 – 179.5 points
C	130.0 – 139.5 points
D	100.0 – 129.5 points
F	< 100.0 points

The final grading scale will include the + and - indicators.

5. Suggested reference material

The following reference material will be helpful during the course:

1. Physics Handbook for Science and Engineering, C. Nordling and J. Österman, Studentlitteratur (2004).
2. Mathematics for Physical Chemistry (3rd ed.), R. G. Mortimer, Academic Press (2005).

6. Practical hints

1. Read the corresponding textbook section and the notes before the lectures. The notes are available at the course web page. Ask questions! When doing this over email, take photos of your work and indicate the place where you need help.
2. The best way to learn physical chemistry is through exercises. This is the reason for the homework being mandatory.
3. Always try to understand the whole concept first and then work out the details.
4. Try to understand the material instead of just memorizing it. The latter approach will not work in physical chemistry and, in general, natural sciences.

7. Academic dishonesty

By enrolling in this class, you agree to abide by all California State University, Northridge policies of academic honesty and integrity. Students violating these standards will receive a zero for the work in question and will have their case referred to the Student Affairs Office for appropriate disciplinary action. See the California State University catalog for details of the University policies.