Laboratory Experiments to be Conducted by the Students

- UV/VIS Absorption Spectra of a Series of Conjugated Dyes
- Time Resolved Laser Spectroscopy of Ru(II) Complexes and Ruby
- Gas Phase/Rotation-Vibration Spectrum of an HCl/DC1 Mixture
- Electrodeposition of Silver on a Quartz Crystal Microbalance (QCM)
- Laser Induced Breakdown Spectroscopy (LIBS) of Solids
- Project development (as requested by the instructor)
- LabView project

Laboratory Requirements

- **Read and prepare in advance for each experiment**
- Be in the lab on time (unless a special agreement is made with the TA/instructor)
- Follow all safety procedures, especially around the lasers
- Record all data directly in your notebook, while in lab. NOTE: even though students may work in groups, students must record their own data in their own notebook.

Prelabs

- Some of the projects require prelabs. You will not be able to start your lab until your prelab is submitted and graded.
- Prelab (if required) is valued at roughly 5-10% of the overall project grade. The exact grade will depend on the length of the prelab.

Laboratory Report

- Each lab requires a written report submitted in a Microsoft Word 1997-2003 format (.doc) using EEE drop box tool. All the necessary images and tables should be included in the file. Students may submit supporting information (such as printouts of FTIR spectra in the HCl/DC1 lab) in printed form.
- Students should also submit all supplementary files such as Excel files used in calculations, along with their Word files.
- Reports should be submitted before the start of the following laboratory. The instructor and/or TA will read through the report, grade it if everything is in order. If revisions are required, the report will be returned to the student for a “re-do”. This “re-do” system will affect the maximal score students can earn for a given lab in the following way:

<table>
<thead>
<tr>
<th>Submission</th>
<th>Due date after the lab</th>
<th>Max. score if only minor changes are requested</th>
<th>Max. score if significant changes are requested</th>
<th>Max. score if (almost) nothing is submitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original submission</td>
<td>+ 1 week</td>
<td>100</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Revision (re-do) #1</td>
<td>+ 2 weeks</td>
<td>No reduction</td>
<td>-10%</td>
<td>-25%</td>
</tr>
<tr>
<td>Revision (re-do) #2</td>
<td>+ 3 weeks</td>
<td>No reduction</td>
<td>-20%</td>
<td>-50%</td>
</tr>
</tbody>
</table>

For example, if a report with significant omission is submitted before the original submission deadline (one week after the lab), it will be returned for a “re-do” and graded
out of 90 points (= 100 points – 10%). If the second submission requires only minor revisions, the maximal score will remain at 90. If the second submission still has significant omissions, the maximal score will become 80.

- Each student must write and submit his/her own report even if the experiments were done in a group. Students from the same group may analyze data together and include identical figures and tables in reports.

**Course grading**

- EVERY lab must be completed, and report submitted, in order to earn a passing grade for this course.
- There will be five wet labs; each lab report will be worth 100 points
- The LabView lab will be worth 100 points
- The final exam will be worth 100 points
- Working on the lab development will add 50 extra credit points
- The maximum number of points you can collect is 700 (plus extra credit)
- Numeric grade = 4*(overall score/ 700)
- Letter grade will be assigned based on your numeric grade

**Required Laboratory Report Format**

- Title and authors
- Abstract – a brief summary of the completed work.
- Introduction – previous work on the subject; necessary theory and formulas, explain why you conducted these experiments and what you hoped to find.
- Experimental – describe the experimental setup.
- Results – present all your data and data analysis in a logical order.
- Discussion – explain the meaning of the results.
- References – include critical literature and papers. Minimize the use of websites as the sources of information; peer-reviewed papers and books are much preferred.

See lab descriptions for more details on report preparation and data analysis.