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/DCI Mixture
- Electrodeposition of Silver on a Quartz Crystal Microbalance (QCM)
- Laser Induced Breakdown Spectroscopy (LIBS) of Solids
- Ozone project
- 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. No Star Wars in the lab please.
- 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 format (.doc or .docx) using EEE drop box tool. All the necessary images and tables should be included in the file.
- Students should also submit all supplementary files such as Excel files used in calculations, along with their Word files. These files will not be graded but we would like to collect examples of your data and analysis files for the future.
- Reports should be submitted before the start of the following lab project. The instructor and/or TA will read through the report, grade it if everything is in order. If revisions are required, the report may 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:
- **Each student must write and submit his/her own report even if the experiments were done in a group.** I will deduct up to 50% points from students who submit similar reports to their partners’. Students from the same group may analyze data together and include identical figures and tables in reports.
- **ALL reports and their re-do versions must be submitted by the end of week 10 (by Saturday, June 4)**
### Submission Days after the lab (or return of the initial report)

<table>
<thead>
<tr>
<th>Submission</th>
<th>Days after the lab</th>
<th>A. Max. score if only minor changes are requested</th>
<th>B. Max. score if significant changes are needed</th>
<th>C. Max. score if (almost) nothing is submitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>First submission</td>
<td>&lt;7 days</td>
<td>100</td>
<td>re-do requested</td>
<td>re-do submitted</td>
</tr>
<tr>
<td>Late first submission</td>
<td>7-14 days</td>
<td>90; no re-do*</td>
<td>90; no re-do*</td>
<td>90; no re-do*</td>
</tr>
<tr>
<td>Late first submission</td>
<td>&gt;14 days</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Revised (re-do) submission</td>
<td>&lt;7 additional days**</td>
<td>100</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>Late revised (re-do) submission</td>
<td>&gt;7 additional days**</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
</tr>
</tbody>
</table>

**NOTES:**

* No re-do is possible if the original submission was not done on time

** The deadline for the revision = within 7 days after you receive the revision request.

Revised reports received after 7 days will not be re-graded

- For example, if a report with significant omissions 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 if the revision is submitted on time. The score will not change if the revision is submitted late.
- If a report is submitted in the 7-14 day window after the lab, no re-do is possible and you receive whatever score your original report earned.
- If no report is submitted 14 days after the lab, the lab earns a zero grade.

#### Course grading

- EVERY lab must be completed, and report submitted, in order to earn a passing grade for this course.
- There will be six “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
- The maximum number of points you can collect is 800
- Numeric grade = 4*(overall score/ 800)
- 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.