CHEM 341.1 sec. 1- Instrumental Methods Laboratory

Lecture Hour: Tu, 1:50 - 2:40 PM, 354 RE

Experimental: Tu, 2:50 - 5:40 PM, 354 RE

SYLLABUS

I. Laboratory Course Format: In-person, on campus unless otherwise notified by the State of New York, the City University of New York, and the Department of Chemistry and Biochemistry.


III. Other Required Materials: Scientific calculator, bound laboratory notebook, flash drive or SD card, safety goggles, lab coat

IV. Some Suggested Reference Sources:

Harris Quantitative Chemical Analysis, seventh (or any) ed. W. H. Freeman and Company New York 2001 (On reserve in Rosenthal Library)


Atkins, de Paula Physical Chemistry, ninth ed. (or any) W. H. Freeman and Company New York 2002 (On reserve in Rosenthal Library)

Bishop Learning with LabVIEW 8 Prentice-Hall New York 2006 (On reserve in Rosenthal Library)


V. Attendance: Both laboratory and lecture (recitation) sessions are required. Excessive absences in either will adversely affect your grade. Class participation will positively affect your grade. The last meeting is mandatory.

VI. Safety: APPROVED MASKS COVERING NOSE AND MOUTH, goggles, long pants or skirts, closed toe shoes, and long hair tied back are required. Eating, drinking, gum chewing, horseplay, stunt experiments, and contact lenses are not allowed; wear glasses to lab if needed. Safety shower, eyewash, and fire extinguisher locations must be noted. Chemical waste handling protocols must be observed; if in doubt ask! Points will be deducted for unsafe practices or violations of waste protocols, and you may be ejected from lab and receive a zero (0) for that experiment.

VII. Course Grade: The course grade will be based on the total points of all assignments and quizzes, as stated above, which will constitute 85% of the grade, the remaining 15% will be from performance in the laboratory, the grand total, minus any deductions for safety infractions, will be used to determine the letter grade for the course; all as mentioned above in Part VII.A.1-5.
VIII. Schedule: *Schedule is subject to change as semester progresses.*

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th><strong>Group 1</strong></th>
<th><strong>Group 2</strong></th>
<th><strong>Group 3</strong></th>
<th><strong>Group 4</strong></th>
<th>Due Date</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>9/1</td>
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<td><strong>Lab 7</strong></td>
<td><strong>Lab 9</strong></td>
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<td></td>
<td></td>
<td><strong>Introduction</strong> Check-in; Safety Lecture; Lab Reports and Syllabus</td>
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<td>2</td>
<td>9/8</td>
<td><strong>Lab 7</strong></td>
<td><strong>Lab 9</strong></td>
<td><strong>Lab 4</strong></td>
<td><strong>Lab 5</strong></td>
<td>9/15, 22</td>
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<td>3</td>
<td>9/15</td>
<td>7</td>
<td>9</td>
<td><strong>Lab 5</strong></td>
<td><strong>Lab 4</strong></td>
<td>9/22</td>
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<td>4</td>
<td>9/22</td>
<td><strong>Lab 4</strong></td>
<td><strong>Lab 5</strong></td>
<td><strong>Lab 7</strong></td>
<td><strong>Lab 9</strong></td>
<td>10/6, 13</td>
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<td>5</td>
<td>10/6</td>
<td><strong>Lab 5</strong></td>
<td><strong>Lab 4</strong></td>
<td>7</td>
<td>9</td>
<td>10/13, 10/13</td>
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<td>6</td>
<td><strong>•10/13 QUIZ 1</strong></td>
<td><strong>Lab 9</strong></td>
<td><strong>Lab 7</strong></td>
<td><strong>Lab 1</strong></td>
<td><strong>Lab 2</strong></td>
<td>10/27, 11/3</td>
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<td>7</td>
<td>10/20</td>
<td>9</td>
<td>7</td>
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<td>2</td>
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<td>8</td>
<td>10/27</td>
<td><strong>Lab 1</strong></td>
<td><strong>Lab 2</strong></td>
<td>1</td>
<td>2</td>
<td>11/17</td>
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<tr>
<td>9</td>
<td>11/3</td>
<td>1</td>
<td>2</td>
<td><strong>Lab 9</strong></td>
<td><strong>Lab 7</strong></td>
<td>11/17</td>
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<td>10</td>
<td>11/10</td>
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<td>11</td>
<td>11/17</td>
<td><strong>Lab 2</strong></td>
<td><strong>Lab 1</strong></td>
<td><strong>Lab 2</strong></td>
<td><strong>Lab 1</strong></td>
<td>12/1, 12/1</td>
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<tr>
<td>12</td>
<td><strong>•11/24 QUIZ 2</strong></td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
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<tr>
<td>13</td>
<td>12/1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
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<tr>
<td>14</td>
<td>12/8</td>
<td>REQUIRED ATTENDANCE</td>
<td></td>
<td>Final papers due, Checkout; Cleanup</td>
<td>all groups n/a</td>
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</tbody>
</table>

**Experiment List**

<table>
<thead>
<tr>
<th>Lab #</th>
<th>Title</th>
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<tbody>
<tr>
<td>1</td>
<td>Programming a NXT LEGO Mindstorms Robot with LabVIEW</td>
</tr>
<tr>
<td>2</td>
<td>Building a Digital Thermometer Using a DAQ in LabVIEW</td>
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<tr>
<td>4</td>
<td>IR Spectroscopy: Determination of Xylenes Using an Internal Standard</td>
</tr>
<tr>
<td>5</td>
<td>Fluorescence Determination of Quinine in Tonic Water</td>
</tr>
<tr>
<td>7</td>
<td>Identification of Some Constituents Using HPLC</td>
</tr>
<tr>
<td>9</td>
<td>Separation and Identification of Some Constituents Using ESI-MS</td>
</tr>
</tbody>
</table>

IX. Work in the Laboratory

A. Safety- Observe all safety protocols, use caution; see § VI, VII above and X.A.5 below.

B. Equipment Usage- You will likely be assigned to work with other students in small groups or teams on the same experiment or equipment. However, your submissions to me are to be solely your own. You must leave the equipment and work areas at the end of the lab period clean and neat; again, observe safety protocols. Put away all glassware, other equipment, and chemicals after use. When finished with an analytical instrument, *do not turn off the computer; simply log out of it.* (See Section VIII. C, below.)
IX. C. Code of Conduct

1. Plagiarism- Plagiarism or any other form of cheating is not tolerated. The student perpetrating such an act will receive a zero (0) for the assignment in question and a warning, along with other possible penalties, for a first offense. A second offense by the student will result in automatic failure of the course (F) and referral to the Chairman and/or the Dean. A failure to properly cite any sources, including figures, charts, tables, and artwork, in a submission or work is also considered plagiarism.

2. Laboratory Conduct- No horseplay. No offensive language. No other activities in the laboratory or classroom that are not relevant to the coursework. Return all items used to proper places, keep equipment and work areas clean and neat. Strictly observe all safety protocols.

D. Lab Computers - The computers in the laboratory are for use with the experiments and related work. They are not for personal recreational use. If a logon is required, please log off but do not shut down when finished for the day.

X. Work to Be Submitted

A. Grading

1. All Reports- Hard copies are due on the dates listed above. Each is graded for completeness and succinctness of content, clarity and effectiveness of presentation, and proper formatting on the basis of 100 points. Be aware that the experiment schedules differ for different groups.
   a. Three-Week Reports- There are two, and together are to be 32% of grade total.
   b. Two-Week Reports- There are two, and together are to be 22% of grade total.
   c. One-Week Reports- There are two, and together weighted 12% of grade total.

2. Notebooks- will be sporadically checked; points deducted at my discretion, if not properly used and maintained, and weighted to be 5% of grade total.

3. Quizzes- There will be two, on the material presented in our lecture (recitation) hour, and together will be 14% of your grade total.

4. Laboratory Performance- will be subjectively evaluated by me and weighted to be 15% of grade total.

5. Safety- Violations of safety rules will result in points deducted from course total at my discretion.

B. Report Structure

1. Format- Reports must be written in the style of a scientific journal article. Refer to ACS or APS style guides, or to examples in papers published in chemistry or physics journals.
X. B. 1. a. **Heading**- title, author(s: your name, name of people in your group),
department and college
b. **Abstract**- This one very short paragraph summing up the whole paper.
c. **Introduction**- Explain what the various approaches that can be taken to perform
the experiment and any theoretical and background information.
The last paragraph should describe the procedure and objective.
d. **Experimental section**- describe what you did– you may insert figures, graphs,
references, tables, if this will better elucidate your text.
e. **Results**- include data here. While the original data is to be recorded in your lab
notebook, they must be reproduced in this section of the paper.
i. **Calculations** - do include figures (graphs, charts, diagrams) and tables.
ii. **Error Analysis**- Discuss your calculations, accuracy, including error analysis.
   Error analysis should be included for all calculations.
f. **Discussion**- What do your results mean? (This is where you make your
   scientific conclusions.)
g. **Conclusions or Summary**- This is more than just a simple synopsis. What is
   noteworthy or can be learned from the work?
h. **References**- Reference citations are to be listed in this section, with the
   annotation superscripts in appropriate places throughout the paper.
   *Do NOT use Internet sources* for your citations. Use actual
   scientific literature, as peer-reviewed journals, textbooks, etc. (Of
   course, you may use the Internet to locate, for example, a journal
   article or book.)

2. **Submission of Reports**
a. Hard copies of assignments must be submitted for credit and are due on the
   scheduled dates, unless otherwise scheduled or notified.
b. **Do not** submit your papers late; late papers are **not acceptable and will receive**
a zero (0) score.
c. **Electronic copies must also be submitted, but are not acceptable for credit.**
d. If you miss an entire experiment due to absence, it may be made up. See me
   for the possibility of making up the experiment.

XI. **Communication**: I can be reached preferably via the discussion group for our course on
BlackBoard, and secondarily via e-mail, but only for messages that
don’t belong on BlackBoard. I encourage everyone to ask questions,
discuss course topics, and answer others’ questions on Blackboard, too!
(Of course, I will check the answers.) Course materials, such as manual
of experiments, this syllabus, and other, ancillary materials will be
posted on Blackboard. **There will be no office visits this semester.**
XII. COVID-19 Concerns:

If you cannot attend class, which is, to date, comprised of in-person sessions, due to COVID-19 concerns, i.e., you have a medical condition or if you live with someone who has pre-existing medical conditions which put you or them at high medical risk from COVID-19 exposure, inform me and you may be exempted from coming to class and alternate assignments provided. See also the New York State COVID-19 FAQ 4/15/20 p.2; link: https://coronavirus.health.ny.gov/system/files/documents/2020/04/doh_covid19_faqs_updated_041720_2.pdf

XIII. CUNY Legal Notice on Live Recordings:

Students who may participate in this class online with their camera on or use a profile image are agreeing to have their video or image recorded solely for the purpose of creating a record for students enrolled in the class to refer to, including those enrolled students who are unable to attend live. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who unmute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live.