Fairleigh Dickinson University
Metropolitan Campus

Syllabus for Physical Chemistry I (Laboratory)
Fall 2009

Course Title: Physical Chemistry I Credits: 2 credits
Course Number: CHEM 3243.51
Time: Monday 5:25 PM – 8:50 PM
Room(s): TBA
Physical Chemistry Lab (fifth floor DH)
Some experiments will be done in the Physics Labs: (Rooms TBA)
Some experiments will be done in the computer lab. (Room: TBA)

Instructor: Dr. Arthur R. Murphy
Office: DH 4413 Office Hours: M W F 10:00 AM – 10:50 AM and by appointment
Telephone: (201)-692-2322
e-mail arthur_murphy@fdu.edu

Required Text: None

Catalog Description: Physical Chemistry Laboratory I
Laboratory experiments demonstrating fundamental laws, concepts and mathematically derived relationships involving selected physico-chemical properties of matter and energy. Corequisite: CHEM 3241.

Policies and Procedures:
1) All cell phones, beepers, and pagers must be turned off during lecture.
2) Students are expected to arrive for lab on time so as not to disrupt the proceedings.
3) Late Lab reports will not be accepted. Lab reports are usually due two weeks after an experiment is concluded. Any exceptions to this rule will be stated in due course.
4) All safety procedures must be followed exactly. Details regarding safety will be discussed during the first lab period. No student will be permitted into laboratories wearing shorts, halter-tops, open toed sandals, undershirts, tank tops or any other inappropriate attire. All students must purchase a white laboratory coat that can be used for any Biology or Chemistry class that requires a lab. This rule applies to everyone taking the lab.
5) In addition to performing the experiments, students will be expected to become proficient in the use of scientific software packages (e.g. Mathcad)
6) Last Day for dropping the course with a grade of "W" is November 3rd.

Grading Policy: Lab Reports: %100
The exact lab report format to be followed will be discussed during the first lab period. Lab reports will be graded on the basis of neatness, thoroughness, adherence to the required lab report format, and experimental accuracy and precision. A thorough discussion of errors must accompany each lab report.
Academic Integrity Policy:
Each student must submit his or her own laboratory report. Copying of reports in full or in part is strictly forbidden and such cheating will be dealt with harshly. Also note that the sharing of computer files in full or in part is strictly forbidden too. A copy of the current Fairleigh Dickinson University Academic Integrity Policy appears at the end of this syllabus.

Introduction:
The Physical Chemistry I Laboratory experiments are chosen so as to reinforced, augment, and amplify the material that is discussed in the Physical Chemistry I lecture course. Experiments involving gases, thermodynamics, and transport processes will be explored.

Course Objectives and Outcomes:

Objective 1: To promote proper laboratory practices and report preparation

**Outcome 1.1:** Know location of safety equipment, and be familiar with emergency procedures. Become aware of proper laboratory attire, and understand laboratory etiquette.

**Outcome 1.2:** Understand proper laboratory report format to be used, and grading criteria to be employed.

**Outcome 1.3:** Use Microcomputers to assist in report preparation.

**Outcome 1.4:** Learn/Review limitations associated with data and experimental uncertainties are handled.

Objective 2: Become proficient at handling chemicals and using laboratory equipment.

**Outcome 2.1:** Be trained in handling of various chemicals.

**Outcome 2.2:** Be trained in proper use of equipment found in standard Physical Chemistry Laboratories: analytical balances, heating units, accurate thermometers, viscometers, tensiometers, etc.

Outcomes assessment:

Students who have successfully completed this course should have reinforced their knowledge of the material covered in the Physical Chemistry I (Lecture Course). Specifically, students should have an understanding of ideal, real gases, and the kinetic theory of gases as well as an understanding of various aspects of applied thermodynamics and some transport properties. These topics are all fundamental, and they should serve as a basis for taking additional chemistry courses such as Physical Chemistry II, Inorganic Chemistry, Biochemistry etc.
**Core Competencies**
As part of FDU’s “Writing Across the Curriculum” initiative, all students will be required to write formal laboratory reports. Standard English and standard grammar must be employed. Students should use computers (Word Processors, Spreadsheets, MathCad) as much as possible to prepare reports, graphs etc.

**Teaching Methodologies / Activities**
Laboratory experimentation is, by its nature, a hands-on activity requiring a structured approach to the exploration and analysis of various scientific problems. Students should learn to appreciate how meaningful answers are obtained to these problems. Laboratory experimentation requires that the student pay attention to detail, have the ability to carryout multi-step procedures so as to acquire meaningful data, and also have the ability to analyzed the experimental results by a variety of means. All of these are important attributes in many fields.

In addition to supervising the performance of experiments, your Instructor will use computer and web resources where applicable.

**TENTATIVE LABORATORY SCHEDULE**

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<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Activity</th>
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<tbody>
<tr>
<td>2</td>
<td>9/21/09</td>
<td>Introduction to Mathcad continued. Non-ideal gases</td>
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<tr>
<td>3</td>
<td>9/28/09</td>
<td>Non-ideal Gas projects</td>
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<td>4</td>
<td>10/5/09</td>
<td>Kinetic Theory Simulator</td>
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<td>5</td>
<td>10/12/09</td>
<td>Kinetic Theory Simulator (continued)</td>
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<td>6</td>
<td>10/19/09</td>
<td>C_p/C_v by Ruckhard’s method</td>
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<td>7</td>
<td>10/26/09</td>
<td>C_p/C_v by Clement Desorme’s method</td>
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<td>8</td>
<td>11/2/09</td>
<td>Heats of Neutralization or Hess’s Law or Heats of Solution</td>
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<td>9</td>
<td>11/9/09</td>
<td>Hess’s Law</td>
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<td>10</td>
<td>11/16/09</td>
<td>Surface Tension (Ring Method)</td>
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<td>11</td>
<td>11/23/09</td>
<td>Surface Tension (Capillary Method)</td>
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<td>11/30/09</td>
<td>Viscosity Measurements</td>
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<td>TBA</td>
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<td>14</td>
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<td>Check-out</td>
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Details regarding the scheduling of specific experiments will be given during the first lab session.

**Academic Integrity**

"What is the University's Academic Integrity Policy?"

Students enrolled at FDU are expected to maintain the highest standards of academic honesty. Students have the responsibility to each other to make known the existence of academic dishonesty to their instructor and then, if necessary, the department chair, school director or academic dean of their College.

Course instructors have the added responsibility to state in advance in their syllabi any special policies and procedures concerning examinations and other academic exercises specific to their course. Students should request this information if not distributed by the instructor.

Academic dishonesty includes, but is not limited to, the following:

**Cheating** - Giving or receiving unauthorized assistance in any academic exercise or examination. Using or attempting to use any unauthorized materials, information or study aids in an examination or academic exercise.

**Plagiarism** - Representing the ideas or language of others as one's own.

**Falsification** - Falsifying or inventing any information, data or citation in an academic exercise.

**Multiple submission** - Submitting substantial portions of an academic exercise more than once for credit without the prior authorization and approval of the current professor.

**Complicity** - Facilitating any of the above actions or performing work that another student then presents as his or her assignment.

**Interference** - Interfering with the ability of a student to perform his or her assignments.

If a student is accused of any of the above infractions, there are sanctions which will be instituted. The Undergraduate Studies Bulletin outlines the procedure followed and the sanctions administered.

The FDU web site includes an **Academic Regulations** page. It is highly recommended that all students familiarize themselves with the specific regulations.