

## CH 151 Fundamentals of Chemistry I Laboratory: Fall 2008

Section AL: Monday 2:00 – 5:00 pm (Dr. Shaver)  
Section BL: Tuesday 9:00 am – noon (Dr. Schmidt)  
Section CL: Tuesday 1:00 – 4:00 pm (Dr. Schmidt)

Section DL: Tuesday 4:30 – 7:30 pm (Dr. Shaver)  
Section EL: Wednesday 2:00 - 5:00 pm (Dr. Schmidt)

### INSTRUCTORS' OFFICE HOURS AND CONTACT INFORMATION:

Instructor	Phone	E-mail	Office	Office Hours (as listed or as arranged)
Dr. Shaun Schmidt	670-2265	<a href="mailto:shaun.schmidt@washburn.edu">shaun.schmidt@washburn.edu</a>	ST 312E	MWF 11-noon
Dr. Alan Shaver	670-3242	<a href="mailto:alan.shaver@washburn.edu">alan.shaver@washburn.edu</a>	ST 312D	M 10:30 - 11:30 a.m T 2:30 – 4:00 p.m W 2:00 – 3:00 p.m

### INTRODUCTION:

Chemistry is an experimental science. The laboratory will introduce to you common laboratory equipment and techniques, allow you to apply the principles learned in lecture to analyze laboratory results and give you a literal feel, ownership, and responsibility for reported observations. Do not get too "stressed-out" over the results. Instead, focus on learning and improving laboratory technique and making the connections between theory and experiment.

### REQUIRED MATERIALS:

- *Laboratory Manual for Principles of General Chemistry prepared for Department of Chemistry, Washburn University*, 7<sup>th</sup> Ed. by J.A. Beran
- Student Lab Notebook with permanent or spiral binding, 100 carbonless duplicate sets, Hayden McNeil Specialty Products (required)
- Scientific calculator (required) (A scientific calculator equipped with a Solver function will be required for CH152)

This manual was prepared for Fundamentals of Chemistry I & II at Washburn University. It only includes material which your instructors deemed essential. Pages 8-10 render descriptions of laboratory equipment. Pages 11-34 present a good review of laboratory techniques. Review these pages. Also review the end of the manual containing Appendices. Over the next two semesters, you will perform most or all of the Experiments. Each Experiment contains a *Prelaboratory Assignment*, which must be completed *prior* to the laboratory; a *Report Sheet*, that you fill out *after* the laboratory; and *Laboratory Questions*. You will not complete the *Laboratory Questions* presented in the text book. Your instructor will provide via E-mail a different set of questions for you to answer in your laboratory notebook.

### LABORATORY NOTEBOOK:

In addition to experimental results, your laboratory work will be assessed according to the clarity of your written records, which needs to be documented in a laboratory notebook. Acceptable procedures for keeping such a document is presented in the Laboratory Manual: read pages 5-8. A common mistake is recording too much information on one page. Laboratory notebooks are relatively cheap; don't try to conserve paper. Make clear delineations between each section such as experimental observations, equations, calculations, and results. Treat your lab notebook as a legal document of your record that you will be able to read and understand a few years into the future. Remember, your lab notebook consists of sequentially numbered carbonless duplicate sets of pages. You will be turning in the *copy* pages for grading so press hard so that your instructor can read your record. Never remove the numbered original pages from your notebook.

### LABORATORY ROUTINE:

You must thoroughly understand the theory behind the week's lab *before* you come to class. If you are having problems with the material presented in the lab, seek help early. Only if you understand the theory behind the lab will you be able to learn and appreciate the techniques that you are using during lab. For these reasons, you will *not be allowed* in lab until your laboratory notebook contains an outline of the laboratory experiment for the day, including items listed on page 7 of your manual: title, date, purpose/objective(s), experimental procedure, list of needed equipment/chemicals/instrumentation. You will not have access to any pages in your laboratory manual while in lab; therefore, your pre-laboratory outline also should contain all material, tables and sections relevant for you to successfully complete the *Report Sheet*.

Follow all safety practices. You must *always* wear safety-goggles while in lab. Sandals/open-toe shoes are *not* allowed.

### EVALUATION:

The Calendar on page 4 shows twelve laboratory experiments scheduled for this course. Each will be graded on a 20 point scale, excluding prelabs. You will tear out the *copy* pages (not the original) of pertinent pages from your notebook and

attach them to each lab *Report Sheet* handed in for grading. The organization and completeness of your notebook *copy* pages, as well as the report sheet and questions section, will be graded. Prelab assignments will be graded on a 5 point (maximum) scale. You will hand in your laboratory notebook at the end of the semester. It will be worth 10 points. At the end of the semester, lab drawer check-out is worth 10 points: all glassware needs to be present, clean, and unbroken. The Group Project is worth 40 points and the details will be explained in a handout.

In addition to lab reports, prelab exercises, a lab book, and lab drawer check-out, your instructor may give you announced, or unannounced quizzes at the beginning of the lab covering any or all of the material that you've encountered, including the current lab assignment. Such a lab quiz may or may not take the place of the prelab. At the end of the semester, your lab grade will be reported as a percentage: the number of points you earn divided by the total points possible times 100%. This percentage represents 20% of your final CH151 grade. *As chemistry is an empirical science, your overall grade in the course will not be more than one letter grade higher than your laboratory grade.*

All assignments are due at the ***beginning*** of the pre-lab discussion section. Lab notebook pages should be stapled to the back of the completed report sheets. ***If accepted***, assignments turned in late will be subject to a reduction in points of 50%.

Experiments are to be done by the individual student, except where pairs or groups are specified. Work not originated by those reporting data will not receive credit and be subject to cheating policy as outlined in the student handbook.

Laboratory participation is required for the successful completion of this course. If you are pregnant or become pregnant during this semester you should consult with your physician to decide if it is advisable for you to continue with this chemistry course. You may obtain a list of chemicals used during labs from your instructor.

## UNIVERSITY ADDITIONS – COURSE SYLLABUS

### Select Mission of the University:

Washburn University shall prepare qualified individuals for careers, further study and life long learning through excellence in teaching and scholarly work. Washburn University shall make a special effort to help individuals reach their full academic potential. *Washburn University Board of Regents, 1999*

### Academic Misconduct Policy:

All students are expected to conduct themselves appropriately and ethically in their academic work. Inappropriate and unethical behavior includes (but is not limited to) giving or receiving unauthorized aid on examinations or in the preparation of papers or other assignments, or knowingly misrepresenting the source of academic work. Washburn University's Academic Impropriety Policy describes academically unethical behavior in greater detail and explains the actions that may be taken when such behavior occurs. For guidelines regarding protection of copyright, consult [www.washburn.edu/copyright/students](http://www.washburn.edu/copyright/students). For a complete copy of the Academic Impropriety Policy, contact the office of the Vice President for Academic Affairs, Bradbury Thompson Alumni Center Suite 200, or go on-line to: [www.washburn.edu/admin/vpaa/fachdbk/FHsec7.html#VIII](http://www.washburn.edu/admin/vpaa/fachdbk/FHsec7.html#VIII)

### Disability Services:

The Student Services Office is responsible for assisting in arranging accommodations and for identifying resources on campus for persons with disabilities. Qualified students with disabilities must register with the office to be eligible for services. The office MUST have appropriate documentation on file in order to provide services. Accommodations may include in-class note takers, test readers and/or scribes, adaptive computer technology, brailled materials. Requests for accommodations should be submitted at least two months before services should begin; however, if you need an accommodation this semester, please contact the Student Services Office immediately.

Location: Student Services, Morgan Hall Room 150

Phone: 785-670-1629 or TDD 785-670-1025

E-Mail: [student-services@washburn.edu](mailto:student-services@washburn.edu)

Students may voluntarily identify themselves to the instructor for a referral to the Student Services Office.

### Center for Undergraduate Studies and Programs (CUSP):

As a Washburn student, you may experience difficulty with issues such as studying, personal problems, time management, or choice of major, classes, or employment. The Center for Undergraduate Studies and Programs (Office of Academic Advising, Educational Opportunity Program, and Office of Career Counseling, Testing and Assessment) is available to help students either directly through academic advising, mentoring, career counseling, testing and developing learning strategies or by identifying the appropriate University resource. If you feel you need someone with whom to discuss an issue confidentially and free of charge, contact CUSP in Morgan 122, 785-670-1299, [advising@washburn.edu](mailto:advising@washburn.edu).

### Withdrawal Policy:

During fall and spring semesters, students may withdraw from full semester courses through the second week of class with no recorded grade. From the third through the eleventh week a "W" is recorded for any dropped course. Beginning with the start of the twelfth week, there are NO withdrawals, and a grade will be assigned for the course. For short-term or summer course deadlines, please check the appropriate Semester/Session Course Bulletin Web Site ([www.washburn.edu/schedule](http://www.washburn.edu/schedule))

### Official E-Mail Address:

Your Washburn University e-mail address will be the official address used by the University for relaying important messages regarding academic and financial information and the University will consider this your official notification for important information. It may also be used by your instructors to provide specific course information. If you prefer to use an alternate e-mail address to receive official University notices, you can access your MyWashburn e-mail account, choose the "Options" tab, and select "Settings", scroll to the bottom of the screen and enter the e-mail address you would like your Washburn emails forwarded to in the "mail forwarding" area. Click on save changes. This will complete the process of forwarding your Washburn e-mail. It is your responsibility to ensure that your official e-mail box does not exceed your message quota resulting in the inability of e-mail messages to be accepted into your mailbox

**CALENDAR:**

<b>WEEK</b>	<b>EXPERIMENT</b>	<b>CONTENT/ASSIGNMENTS DUE</b>
8/18	1 <sup>st</sup> day stuff, Safety Film	Lab & Lab notebook lecture; Check-In Lockers; Balance Demonstration Identify lab safety features & read pp 1-4 for Quiz
8/25	#1 (pp 37-44) Basic Lab Operations #2 (pp 57-64) NOTE PAGES!!! Physical Properties Parts A and B	Familiarity with Laboratory Equipment Identification of a compound - physical properties <i>Safety Quiz, CAS-MSDS handout</i> <i>Prelab #1, Prelab #2 – Physical Properties (Pages 61-62)</i>
9/1	Labs do not meet this week	<i>Lab #1 is due Wednesday 9/3 in Lecture</i>
9/8	#2 (pp 57-64) NOTE PAGES!!! Physical Properties Parts C, D, and E #2 (pp 65-72) Chemical Properties	Identification of a compound - physical properties (continued) Identification of a compound - chemical properties <i>Prelab #2 – Chemical Properties (Pages 69-70)</i>
9/15	#6 (pp 89-94) Pairs Formula of a Hydrate	Gravimetric analysis; percent by mass <i>Lab #2 – Physical Properties,</i> <i>Lab#2 – Chemical Properties; Prelab #6</i>
9/22	#8 (pp 95-102) Pairs Limiting Reactant	Stoichiometry; mass ratios; percent yield <i>Lab#6; Prelab #8</i>
9/29	#5 (pp 81-88) Pairs Chemistry of Copper	Laboratory techniques using the copper cycle <i>Lab#8; Prelab #5</i>
10/6	#18 (pp 103-110) Molar Mass - Volatile Liquid	Physical properties of a gas <i>Lab #5; Prelab #18</i>
10/13	#19 (pp 111-118) Molar Volume	Generation, collection of a gas; percent composition <i>Lab #18; Prelab #19</i>
10/20	#21 (pp 119-130) Pairs Calorimetry	Specific heat; Enthalpy of Neutralization & Solution <i>Lab #19; Prelab #21</i>
10/27	#9 (pp 131-140) Pairs A Volumetric Analysis	Standardize a sodium hydroxide solution. <i>Lab #21 Prelab #9</i>
11/3	#16 (pp141-148) Vitamin C Analysis Download revised report sheets	Redox titration <i>Lab#9; Prelab #16</i>
11/10	Handout:* Group Project	Handout: Self-directed chemical analysis <i>Lab#16; Group Project lab book write-up</i>
11/17	Continuation: Group Project	Modification to procedures used in prior week <i>Lab book write-up: modified experimental procedure</i>
11/24	#11 (pp 45-56) Periodic Table & Law Labs do not meet this week	An exercise to be done outside of laboratory this week <i>Lab #11 is due Monday 11/24 in lecture</i>
12/1	Check-out	Ensure lab equipment in drawer matches list <i>Turn in Completed Lab Notebook and Group Project Report</i>

Reference: "Laboratory Manual for Principles of General Chemistry", 7<sup>th</sup> Ed. by J.A. Beran

\*Group Project will take two weeks: it will be graded on a 40 point scale.