Analytical Chemistry (Chemistry 442) Lecture and Laboratory Syllabus
Spring 2017

Lecture Instructor: Dr. E. McJimpsey, Department of Chemistry, Assistant Professor
Office: Currens Hall 519D, phone number: 309.298.3271, and e-mail: EL-Mcjimpsey@wiu.edu
Lecture: T. and R. 8:00-9:15am, Currens Hall 203
T.A.: Taylor Burgess (ts-burgess@wiu.edu)

Lab Instructors: Dr. E. McJimpsey (January 17-March 7, 2017)
Dr. J. Determan, (March 21-April 25, 2017)
Currens Hall 519C, office hours: M.W.R.11am-1pm
e-mail: jj-determan@wiu.edu

Laboratory: TA: Taylor Burgess (ts-burgess@wiu.edu), Drew Whippie (dl-whippie@wiu.edu)
Section 21- Tues. 11:00am-1:50pm, Currens Hall 519
Section 22- Tues. 3:00pm-5:50pm, Currens Hall 519

Chem 442 Prerequisite: Completion of Chem 341.

Note: This syllabus may be modified throughout the semester as needed.

Required Materials:

• Course Syllabus: PDF file downloadable from Western Online
• Access to the Sapling Learning Online Homework Site (can be purchased online or through the bookstore)
• Official Laboratory Research Notebook-50 pages (Available at the WIU bookstore.)
• Material Safety Data Sheets (MSDS) information about all chemicals utilized in the laboratory can be found at the following web site.
  http://avogadro.chem.iastate.edu/MSDS/. E-copies are free of charge.
• Approved safety goggles are required for the Chem 442 laboratory.
• Scientific calculator
• Laboratory usage fee of $35

Testing and Grading:
Three 50 min exams and a comprehensive, standardized American Chemical Society (ACS) Instrumental Analysis final exam (100 min) will be given. The exam format is at the discretion of the instructor but may include any of the following: short answers, essays, true/false, or fill in the
blank questions. Exam grades will be made available on Western Online within one week after the exam date. Sapling assignments will be given throughout the semester and must be completed online. Make-up exams for physician documented absences can be taken in the form of a comprehensive exam towards the end of the semester. No make-up assignments will be given. Ten laboratory experiments will be conducted and used to determine the final grade.

**Sapling Learning Online Homework:**

The Sapling assignments are only accessible through the Sapling Learning (Macmillan Learning) Website. Assignment due dates are also posted on this site. The website log-in instructions are below.

1. Go to [saplinglearning.com](http://saplinglearning.com) and click on the **Higher Ed** option for your country at the top right.

2. Log in with your existing account or click **Create an Account**.
   a. If you have a Facebook account, you can use it to quickly create a Sapling Learning account. Click Create my account through Facebook. You will be prompted to log into Facebook if you aren't already. Choose a username and password, then click Link Account.
   b. Otherwise, supply the requested information and click Create My Account. Check your email (and spam filter) for a message from Sapling Learning and click on the link provided in that email. If you don't get the email within 30 minutes, contact support@saplinglearning.com.

3. Look for the gray bar entitled **Enroll in a new course**.

4. Click on your subject to expand the menu.

5. Click on the term to expand the menu further (**note** that Semester 1 refers to the first course in a sequence and not necessarily the first term of the school year).

6. Once the menus are fully expanded, you'll see a link to a specific course. If this is indeed the course you'd like to register for, click the link. Otherwise, continue expanding the other menus until you locate the correct link and click it.

Enter your zipcode and pay if necessary. Most courses require payment using a credit card, a PayPal account, or an **Access Card Code** ([http://www2.saplinglearning.com/help/how-do-i-enter-code-my-scratch-card](http://www2.saplinglearning.com/help/how-do-i-enter-code-my-scratch-card)) from a scratch-off card purchased at your bookstore. In some cases, you may have additional options to **enter the course for free for x days**, to use your Sapling Learning credit, or to buy **multiple items for a bulk discount**.
Assignments: 15%
3 Exams: 45%
Final Exam: 15%
10 Laboratory Reports: 20%
2 Laboratory Exams: 5%

Weighted Grade Calculation
15 (assignment grade points earned / assignment grade points available) + 20 (laboratory report grade points earned / laboratory report grade points available) + 5 (laboratory final exam grade points earned / laboratory final exam grade points available) + 45 (exam grade points earned / exam grade points available) + 15 (final exam grade points earned / final exam grade points available) = Grade (%)
## Important Dates:

<table>
<thead>
<tr>
<th>Date (Spring, 2017)</th>
<th>Event</th>
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<tbody>
<tr>
<td>January 16, Mon.</td>
<td>Martin Luther King Day - University is closed</td>
</tr>
<tr>
<td>January 17, Tues.</td>
<td>Classes Begin</td>
</tr>
<tr>
<td>February 13, Mon.</td>
<td>Lincoln's Birthday - University is closed</td>
</tr>
<tr>
<td>February 14, Tues.</td>
<td>Classes Resume</td>
</tr>
<tr>
<td>March 13-17, Mon.-Fri.</td>
<td>Spring Break - No Classes</td>
</tr>
<tr>
<td>March 20, Mon.</td>
<td>Classes Resume</td>
</tr>
<tr>
<td>May 8-12, Mon.-Fri.</td>
<td>Final Exam</td>
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</tbody>
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## Tentative Laboratory Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Laboratory Experiments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tues., Jan. 17, 2017</td>
<td>No Class</td>
</tr>
<tr>
<td>Tues., Jan. 24, 2017</td>
<td>Check-In</td>
</tr>
<tr>
<td>Tues., Jan. 31, 2017</td>
<td>Exp. #1, Comparing Transmittance and Absorbance of KMnO₄ in UV/VIS Spectroscopy (Exp. 2.1 and 2.2, p. 108)</td>
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<tr>
<td>Tues., Feb. 7, 2017</td>
<td>Exp. #2, Determination of L-Phenylephrine Concentration in Dristan Nasal Spray Using UV/VIS Spectroscopy (Exp. 5.10, p. 433)</td>
</tr>
<tr>
<td>Tues., Feb. 14, 2017</td>
<td>Exp. #3, Proteomics Virtual Laboratory, Currens Hall 529 (handout)</td>
</tr>
<tr>
<td>Tues., Feb. 21, 2017</td>
<td>Exp. #4, FTIR Absorption Comparison of Hexane, Cyclohexane, and 2-Hexanone (Exp. 4.1 and 4.2, p. 348)</td>
</tr>
<tr>
<td>Tues., Feb. 28, 2017</td>
<td>Exp. #5, Determination of Sodium Concentration in Soda Using Atomic Absorption Spectrometry (Exp. 6.3, p. 490)</td>
</tr>
<tr>
<td>Tues., March 7, 2017</td>
<td><strong>Laboratory Exam 1</strong></td>
</tr>
<tr>
<td>Tues., March 21, 2017</td>
<td>Exp. #6, Quantitative Determination of Riboflavin Content via Fluorescence Spectroscopy (handout)</td>
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<tr>
<td>Tues., March 28, 2017</td>
<td>Exp. #7, Quantitative Determination of Limonene in Orange Oil Content Using Gas Chromatography (handout)</td>
</tr>
<tr>
<td>Tues., April 4, 2017</td>
<td>Exp. #8, Quantitative Analysis of Caffeine Concentration in Tablets Using HPLC (handout)</td>
</tr>
<tr>
<td>Tues., April 11, 2017</td>
<td>Exp. #9, Peptide Mapping of Trypsin Digested Bovine Serum Albumin Using HPLC (handout)</td>
</tr>
<tr>
<td>Tues., April 18, 2017</td>
<td>Exp. #10, Determination of Fluoride in Water With Ion Selective Electrode (handout)</td>
</tr>
<tr>
<td>Tues., April 25, 2017</td>
<td><strong>Laboratory Exam 2</strong></td>
</tr>
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Safety:
Safety is of primary concern in the chemistry laboratory. Prior to each laboratory experiment, please review the Material Safety Data Sheets (MSDS) for the hazards of the chemicals being used in each experiment at the website, http://hazard.com/msds/. Additionally, safety goggles must be worn at all times while in the laboratory, as well, as closed-toed shoes and pants covering the entire shin. Shoulders must also be covered. Failure to adhere to these policies will result in a student being asked to leave the lab. The lab will be considered as a missed session.

Laboratory Reports:
Each laboratory experiment and report is expected to be completed. Laboratory reports are due one week after the scheduled completion of the experiment. There will be a 12pt loss for each day (including weekends) it is late. The laboratory reports should be submitted to the “assignment” folder on Western Online on or before the scheduled lab date; a paper copy should be submitted to the TA on your lab day. Laboratory (pre- and post-) reports will be analyzed by the software, TurnitIn, for plagiarism; post-laboratory TurnitIn scores above 35% will result in an 80% deduction in overall report points. Additionally, please be aware that school policy requires notification of all cheating to the departmental chairperson. If the report is late, place it in your instructor’s mailbox in the chemistry department office. No late materials will be accepted beyond one week after the due date. Missing any scheduled laboratory activities will result in a loss of points.

Report Format:
Pre- and post-laboratory reports are to be typewritten (Font: 12, Times New Roman and 1 inch margins with justified formatting). Pre-laboratory reports must be done prior to the laboratory and must include a cover page and the following 5 sections: objective of the experiment, experimental theory/background, materials, procedures (in your own words), and reference. The final laboratory report should include the revised pre-laboratory report sections, as well as the: experimental results (including calculations), discussion and conclusion, and answers to end of the lab questions (separate section). A copy of the raw data should be included at the end of the final report. Lab reports should represent each student’s individual work. Participation in the laboratory requires completion of pre-laboratory report, including all calculations needed for
experimental sample preparation prior to the start of class. Do not print on both sides of the paper.

_Laboratory Report Section Formatting_

A stand-alone **cover page** (2 pts) should be the first page of the laboratory report. It must include the title of the experiment, course number, your name (bold type) and the name of your lab partner, the names of your lab instructor and TA (for that experiment), and the date that the lab was performed; the text should be centered in the middle of the page. Two to three sentences about the **objective** (2 pts) of the experiment should be given. The **theory/background** section (14 pts) should be no less than ½ of a page and summarize how the objectives will be realized. For example, important reactions, techniques, or instrumental methods can be discussed; all sources utilized used should be cited. The theory section should not include a description of the procedure. All chemicals, reagents (including concentrations), instruments, devices, and glassware should be recorded in the **materials** section (5 pts). The **procedure** (methods) section (10 pts) should give a description of the laboratory experiment that was performed and should be written in your own words. Arabic numerals should not be used at the beginning of a sentence and the procedure must be written in past tense and a passive voice. The **results** section (20 pts) should report findings and include all tables, graphs, and calculations. A representative example for each calculation should be labeled with a title, typewritten, and included in the in this section (i.e. mean, standard deviation, etc.). All data should be typed and organized in tables. Tables and graphs should have titles and the x/y axis should be labeled. All calculations should include the appropriate units. The **discussion and conclusion** section (20pts) should be used to interpret the findings, draw conclusions, and explain erroneous findings from the data that was collected and analyzed. The **reference** section (5 pts) should follow the conclusion and contain a minimum of two book or peer-reviewed article references (a combination of the two can be used); use American Chemical Society style formatting for the citations. The **questions** (15 pts) should be the last section of the report. Raw data from the laboratory notebook (2 pts) should be attached to the last page of report. **Grammar and syntax** will also be graded (5 pts).

_Writing Center:_
The University Writing Center is available to assist with general and specific questions on writing assignments, including laboratory reports. One-on-one assistance is available. The University Writing Center is located in Malpass Library (3rd floor, west side and in satellite centers in Simpkins, Bayliss, and Tanner). An appointment can be made by phone at 309.298.2815.

**Attendance Policy:**
Students are expected to punctually attend all lecture and laboratory classes. A total of 3 excused and 1 unexcused absences are allowed. The WIU policy on class attendance can be found at: [http://www.wiu.edu/student_services/student_development_office/current/absence_policy.php](http://www.wiu.edu/student_services/student_development_office/current/absence_policy.php). An OARS report must be filed with each absence. Failure to report the absence will result in the absence being recorded as unexcused. Any student arriving more than ten minutes late for a quiz, exam, or laboratory exercise will be allowed to take or complete the assigned work at the instructor’s discretion. Any student who receives six or more absences may be dropped from this course without notice.

**Outside work requirements:** Students are expected to read ahead and be prepared for class. Reading the designated chapter before the class and going over the notes after each class is recommended. A daily minimum of 1-1.5 hrs. of out of class work is needed to do well in this class.

**Classroom and Course Policies:** Any student convicted of academic dishonesty will receive a failing grade and may be subjected to further academic penalty, including expulsion. See the WIU academic dishonesty policy 4 ([http://www.wiu.edu/policies/acintegrity.shtml](http://www.wiu.edu/policies/acintegrity.shtml)).

**Emergency Preparedness:** The WIU Office of Risk Management and Emergency Preparedness provides resources on how to respond to emergency situations. Please view the video resources at [http://www.wiu.edu/rmep/](http://www.wiu.edu/rmep/).

**Students with Disabilities:**
In accordance with University values and disability law, students with disabilities may request
academic accommodations where there are aspects of a course that result in barriers to inclusion or accurate assessment of achievement. To file an official request for disability-related accommodations, please contact the Disability Resource Center at 309-298-2512, disability@wiu.edu or in 143 Memorial Hall. Please notify the instructor as soon as possible to ensure that this course is accessible to you in a timely manner.

**University Values**

University values, Title IX, and other federal and state laws prohibit sex discrimination, including sexual assault/misconduct, dating/domestic violence, and stalking. If you, or someone you know, has been the victim of any of these offenses, we encourage you to report this to the Title IX Coordinator at 309-298-1977 or anonymously online at: http://www.wiu.edu/equal_opportunity_and_access/request_form/index.php. If you disclose an incident to a faculty member, the faculty member must notify the Title IX Coordinator. The complete Title IX policy is available at: http://www.wiu.edu/vpas/policies/titleIX.php.

**Students Rights and Responsibilities:**
The WIU policy on the rights and responsibilities of students can be found at http://www.wiu.edu/provost/students.php.

**Academic Integrity Policy:**
The WIU policy on academic integrity can be found at http://www.wiu.edu/policies/acintegrity.php.

**Disruptive Student Policy:**
The WIU classroom policy on disruptive classroom behavior can be found at: http://www.wiu.edu/vpas/policies/disruptst.php

**Any situation, condition, or circumstance not covered in the syllabus is the option of the instructor and subject to the decision of the instructor**