Course Syllabus
CHEM 102
Chemistry Related to Life Sciences
Fall Semester 2018

LECTURES: M, W, & F — 210 – 300 PM Todd 130

INSTRUCTOR: Prof. Amy Nielsen
Fulmer 468
amy.nielsen@wsu.edu

In email communications, be sure to include “Chem 102” in the subject line; emails without will not be answered.

OFFICE HOURS: M, W, & F –1-2PM, sign up for time slot outside of Fulmer 468

GENERAL CHEMISTRY OFFICE: Nikki Clark
Fulmer 319A
335-1516
nikki_clark@wsu.edu

LABORATORY SUPERVISOR: Ryan Rice
Fulmer 309
335-6358
rwrice@wsu.edu

COURSE WEBSITE: Blackboard Learn (Bb) https://learn.wsu.edu

GRADING:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
<th>Grade Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 &quot;Midterm&quot; Exams</td>
<td>35% or 50%</td>
<td>93-100 A</td>
</tr>
<tr>
<td>Final Exam</td>
<td>15% or 0%</td>
<td>74-76 C</td>
</tr>
<tr>
<td>Homework Sets (12/14)</td>
<td>20%</td>
<td>90-92 A-</td>
</tr>
<tr>
<td>Learning Catalytics</td>
<td>5%</td>
<td>87-89 B+</td>
</tr>
<tr>
<td>10* of 13 Laboratory Experiments</td>
<td>25%</td>
<td>80-86 B</td>
</tr>
</tbody>
</table>

*see below for details.

1 The final exam is mandatory and comprehensive. Your grade will be determined with this formula, with the highest score determining your grade.

EXAMS:

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thursday, Sept. 20</td>
<td>6:00–7:00pm</td>
</tr>
<tr>
<td>2</td>
<td>Thursday, Oct. 18</td>
<td>6:00–7:00pm</td>
</tr>
<tr>
<td>3</td>
<td>Thursday, Nov. 15</td>
<td>6:00–7:00pm</td>
</tr>
<tr>
<td>Final</td>
<td>Thursday December 13</td>
<td>7:00-9:00pm</td>
</tr>
</tbody>
</table>

*The Final Exam will be on December 13. DO NOT SCHEDULE ANY TRAVEL THAT MAY CONFLICT!

REQUIRED MATERIALS:

- Lab notebook: (Duplicating with page numbers), Lab goggles: fully sealing (no holes or open vents-cannot be lab glasses), Lab coat
- Calculator: Must be scientific, but cannot have full keyboard or network capabilities.
### New Course Materials Policy

In an ongoing effort to reduce course materials costs, WSU has partnered with the Bookie and Pearson Education in a new pilot program called First Day. First Day adds course materials charges to your student account when registering for Chem 101, 102, 103, 105, 106, 116, 345, or 348. The cost of course materials for these classes is $66.71 per semester and includes an eBook, the Mastering Chemistry homework system, and where used, the classrooms responses system called Learning Catalytics. This cost is almost 50% less than in prior semesters. While you may opt out of this purchase, the homework system is a required course material and represents a significant portion of your grade. If you have already purchased Mastering Chemistry in fall of 2017, your student fee account will be refunded.

Some key points about the First Day pilot:

- This partnership results in a large savings over prior semesters for the same materials.
- You will have access to all course materials on the first day of class, regardless of any delays in financial aid.
- If you drop the course by the 30th day of instruction, you will receive a full refund.
- If you withdraw after the 30th day and you take the course in a future semester, you will not be charged again for course materials.
- The First Day program is managed through your course Blackboard space. Simply click the Mastering Chemistry link within the Blackboard course space to have immediate access.
- The Bookie will stock physical copies of the text, but these are not required for the course.

We will conduct a survey at the end of the term to solicit feedback on First Day.

### LECTURE SCHEDULE

<table>
<thead>
<tr>
<th>WEEK OF</th>
<th>CHAPTER *</th>
<th>TOPIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 20</td>
<td>12, 13</td>
<td>Organic Chemistry: It’s all about stuff</td>
</tr>
<tr>
<td>Aug 27</td>
<td>14, 15, 16</td>
<td>The Behavior of Stuff – Functional Groups</td>
</tr>
<tr>
<td>Sept 3</td>
<td>17</td>
<td>Carboxylic Acids – your new favorite functional group</td>
</tr>
<tr>
<td>Sept 10</td>
<td>18</td>
<td>Polymers in nature – amino acids and proteins</td>
</tr>
<tr>
<td>Sept 17</td>
<td>19</td>
<td>Polymers in action – enzymes (and vitamins too!)</td>
</tr>
<tr>
<td>Sept 24</td>
<td>21</td>
<td>Fuel up! The generation of biochemical energy</td>
</tr>
<tr>
<td>Oct 1</td>
<td>20</td>
<td>Carbohydrates – Compounds with Personality</td>
</tr>
<tr>
<td>Oct 8</td>
<td>22</td>
<td>The sweet life – carbohydrate metabolism</td>
</tr>
<tr>
<td>Oct 15</td>
<td>23</td>
<td>Lipids –</td>
</tr>
<tr>
<td>Oct 22</td>
<td>24</td>
<td>Lipid Metabolism – time to chew the fat</td>
</tr>
<tr>
<td>Oct 29</td>
<td>25</td>
<td>Protein and Amino Acid Metabolism</td>
</tr>
<tr>
<td>Nov 5</td>
<td>26</td>
<td>Nucleic Acids, DNA</td>
</tr>
<tr>
<td>Nov 12</td>
<td>27</td>
<td>Putting all together - Jurassic Park style</td>
</tr>
<tr>
<td>Nov 19</td>
<td></td>
<td>Thanksgiving Break – woooooooooo!!</td>
</tr>
<tr>
<td>Nov 26</td>
<td>28</td>
<td>Hormones, Neurotransmitters, and Drugs</td>
</tr>
<tr>
<td>Dec 3</td>
<td>29</td>
<td>Defense! Intro to immunology and body fluids</td>
</tr>
<tr>
<td>Dec 10</td>
<td></td>
<td>Final Exam Week</td>
</tr>
</tbody>
</table>
September 18th is the last day to withdraw from class without academic penalty!

PLEASE NOTE: This is a tentative syllabus and schedule and is subject to modification at the instructor's discretion.

LABORATORY SCHEDULE

<table>
<thead>
<tr>
<th>WEEK OF</th>
<th>TITLE</th>
</tr>
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<tbody>
<tr>
<td>Aug 20</td>
<td>Chem 101 Review</td>
</tr>
<tr>
<td>Aug 27</td>
<td>Models of Organic Molecules</td>
</tr>
<tr>
<td>Sept 3</td>
<td>Organic Redox Reactions</td>
</tr>
<tr>
<td>Sept 10</td>
<td>pH Titration of an Amino Acid</td>
</tr>
<tr>
<td>Sept 17</td>
<td>Synthesis of Aspirin and Nylon</td>
</tr>
<tr>
<td>Sept 24</td>
<td>Enzyme Kinetics</td>
</tr>
<tr>
<td>Oct 1</td>
<td>Production of Ethanol 1</td>
</tr>
<tr>
<td>Oct 8</td>
<td>Production of Ethanol 2</td>
</tr>
<tr>
<td>Oct 15</td>
<td>Analysis of Vitamin C in Fruit Juice</td>
</tr>
<tr>
<td>Oct 22</td>
<td>Isolation of DNA</td>
</tr>
<tr>
<td>Oct 29</td>
<td>Riboflavin Pill Extraction</td>
</tr>
<tr>
<td>Nov 5</td>
<td>Ester Formation Reactions</td>
</tr>
<tr>
<td>Nov 12</td>
<td>Drug Receptors Activity</td>
</tr>
<tr>
<td>Nov 19</td>
<td><strong>Thanksgiving holiday break</strong></td>
</tr>
<tr>
<td>Nov 26</td>
<td>TBD</td>
</tr>
<tr>
<td>Dec 3</td>
<td>In-lab Final Exam Review</td>
</tr>
</tbody>
</table>

Required Laboratory Course Materials

A. eTextbook, Mastering Chemistry, and Learning Catalytics package
B. Chemistry 102 Laboratory Manual (online thru blackboard – free!)
C. Safety Goggles and labcoat

Course Objectives

Have you ever enrolled in a course wondering what the subject was all about and what you were going to learn and left the course wondering the same things?!?! You did not know the objectives going in, so you did not know what you should expect to learn. In turn, since you did
not have a framework upon which to build your learning, you had no basis for understanding what you did learn. Frustrating!

In an effort to try to avoid this frustration, to clearly spell out the expectations of this course, and to enhance your learning, I’ve developed a By-Chapter Study Guide for each of the units that we will cover over the course of the semester. You will find these on the course website in blackboard (under the course materials and syllabus tab). How should you use the By-Chapter Study Guide? 1) Print it out now and use it daily to guide your pre-lecture reading and your post-lecture studying, 2) As you are working problems, use it to help you focus on main concepts, and 3) When studying for tests, use it to make sure you are studying what you need to know. This is intended to help you, but you MUST USE IT to realize its benefits!

Homework

Working homework problems is critical to your success in chemistry. On the course website in blackboard in the Mastering Chemistry tab on the left, you will find your weekly homework problems. Why do you have to do homework? The more problems you work, the better your chances for success. (Note: “Problem” is not defined only as, “A question with a numerical solution”!) Homework problems are graded electronica
dy and scores synced automatically. If you want to do well in this class, WORK PROBLEMS! End of chapter problems, practice exam problems, etc. When working problems, the idea is to learn the material while discovering the correct answer. Simply getting the correct answer is NOT your goal. There will be a total of 14 weekly homework assignments administered through the Mastering Chemistry, of which 12 will be counted towards your grade. (20% of your grade). You must complete all assignments for your lowest 2 to be dropped. The due date/time for each assignment will be listed with the assignment on the Mastering Chemistry site. It is recommended that you examine the homework on the Monday it is posted and print it out so that you may consult TAs in lab and office hours during the week. The option to request answers to the homework problems will not be available until the day after the assignment is due. If you wish to see the answer to a problem, go back to the assignment after the due date and request the answers. If you have questions about how to answer a question, it is highly recommended you go to TA office hours. TAs for Chem 102 are specifically selected to help students with this course – they are experts! Remember that the course Facebook account is also a great way to get help with homework and other issues by uploading screenshots. Homework assignments may only be submitted via the Mastering Chemistry system. Homework assignments are due on Sunday nights at 1159PM. Late homework assignments will not be accepted for any reason.

Office Hours and Class Communication

My office hours are listed on the first page of this syllabus. If the designated hours conflict with your class schedule, and you would like to set up a specific time to come see me, please send me an email. I am here to help you learn, but you have to make use of my help. I don’t always know when you are lost or struggling, so please come see me!!! You will find that when we work one-on-one, you will benefit from my being able to help you specifically. PLEASE COME SEE ME.

I will regularly communicate with you through the course facebook page. You must use your WSU e-mail address to communicate with me or your TAs, and be sure to check that address at least daily. I will use facebook to update you on course info such as test dates, cancelled classes,
lab schedule changes, etc. So you MUST routinely check your campus e-mail and the facebook page. “I didn’t get the e-mail” does not constitute a legitimate excuse in Chem 102.

**TA Office Hours:** All chemistry TAs hold their office hours in the TA room in Fulmer 401 from 10:00am –4:00pm Monday –Thursday. You may ask any Chem TA for help in this course; however, TA’s are NOT allowed or obligated to do your homework, pre-labs or lab reports for you, they can only guide you. When you go to office hours for help, be prepared with questions ahead of time! TAs will also monitor the course Facebook page and offer help there. The chemistry department has a computer laboratory in Fulmer 401. You have already paid a fee to support this facility. You may use the computers in this lab for no additional charge, although there may be restrictions on printing.

**Exams**
There will be three midterm exams and a comprehensive final that will cover lecture, lab, and homework material. All exams will be short answer or equivalent and must be filled in with blue or black ink. (You can see old exams in course materials folder) Unless otherwise announced, no calculators may be used during the exams. Exams may be given in rooms other than the regular classroom. These rooms will be announced. No make-up exams will be given. If you are unable to take a scheduled exam for academic reasons beyond your control, you may be allowed to schedule the exam at an earlier time. Tests missed due to documented illness will be excused, with the other exams and the final exam pro-rated to count for more. Evening tests take precedence over all other university activities.

**Academic Dishonesty**
The policies of Washington State University concerning academic dishonesty are thoroughly outlined at https://academicintegrity.wsu.edu/ that is produced by the Provost’s Office. These policies will be strictly adhered to in this course. The instructor adamantly disapproves of academic dishonesty and will prosecute all cases to the fullest extent allowable—a grade of "F" for the course, no exceptions!

**Attendance and Make-ups**
You should attend all class meetings, labs, and exams. The course lecture material, while based roughly on your text, does not follow the order as presented in your text; additionally, supplementary information will be a routine part of lecture. Therefore, failure to attend a regularly scheduled class session will result in a substantial deficiency in your available information at quiz/exam time. **DO NOT COUNT ON CLASSMATES NOTES TO CATCH YOU UP!!!**

This seemingly innocent practice has led to the destruction of many friendships, relationships, lives, etc.

Make-up exams and quizzes will not be given! If you must miss an exam or quiz, you should notify the instructor in advance. At that point, you will choose an appropriate course of action from the options outlined by the professor. Missed exams and quizzes are handled on a case-by-case basis, so don't expect to get the same options as a classmate who missed an exam or quiz. And, as stated above, it is IMPOSSIBLE to make up a laboratory experiment. In short, the only thing that should prevent you from taking a quiz or exam or attending a scheduled lab is your own expiration!

**Timeliness and Classroom Etiquette**
All assignments must be turned in at the specified time. Late assignments will receive a zero, unless extreme extenuating circumstances are documented. NO EXCEPTIONS!!!!

Please turn off all cellular phones, beepers, pagers, beeping watches, etc. before class begins. Neither your classmates nor I will appreciate class being interrupted by one of these devices. The owner of any such device which rings, buzzes, beeps, etc. during a class, lab, or exam will be assessed a 5% penalty on his/her next exam. The instructor reserves the right to pursue solutions to classroom disruptions as outlined at https://aware.wsu.edu/faculty-guide-for-responding-to-disruptive-students/.

**Laboratory**

In Chem 102, we have no recitation before lab. The lab in Chem 102 is designed to correlate with and support your learning of the lecture materials. Instead of recitation, at the end of each Monday lecture, we will have a short 15-20 minute discussion about what you will be doing in lab and how that ties in with what we’re learning in class. You must be on time for your lab session, and you should come prepared. You should read the lab thoroughly in advance and bring any questions you may have to me or the TAs in office hours.

Your course section includes a lecture time and a laboratory time. The laboratory must be completed in order to pass the course. There will be 13 laboratory experiments, including worksheet labs. The two lowest (of 13) scores will be dropped. You must receive 10 non-zero laboratory experiment reports in order to pass the class. The third missed lab will be given a score of zero. A 4th missed/zero in lab will result in an automatic failure of the course, resulting in an F. No late lab reports will be accepted. If you have more than 10 non-zero lab scores, a percentage of those “extra” lab points will be awarded as extra credit.

**Make-up labs:** There are NO make-up labs in this course. If you miss a lab for any reason, it will count as one of your drops. If a 4th lab is missed, you will automatically fail the course with an F.

**Pre-laboratory assignments:** Pre-laboratory assignments are found online on the course Blackboard page and are due Tuesdays at 7:00am the week you are performing that experiment. Students who fail to submit a complete pre-lab assignment at this time will receive a zero on the pre-lab AND be required to complete the pre-lab assignment before they are admitted to lab. A pre-lab verification slip must be obtained from the general chemistry office prior to being admitted to lab. The student will not be given extra time in the laboratory to make up for laboratory time spent completing the pre-lab.

**Laboratory procedure:** Students are to perform the experiments individually unless the laboratory manual specifically requires partners for the experiment being performed. Each student is expected to record all data and observations for each experiment directly into their own laboratory notebook. Data may not be recorded on loose, ‘scratch’ paper then transferred to the notebook. Submission of identical data by two or more students who are not assigned to be laboratory partners will be considered cheating.

Appropriate penalties will be applied to all parties. Some experiments will require you to transfer data from your notebook into a laboratory computer before you leave lab. The data and any computer-generated data must be written in the notebook! You are required to get your TA’s signature on your data/observations at the end of the experiment. You will then submit the original copy of the data to your TA before you leave lab.

**Laboratory dress code:** For your safety, a strict dress code will be enforced in the laboratory. Failure to comply with the dress code will result in expulsion from the laboratory and
a consequent score of zero for that experiment. The dress code requires that you be fully clothed from shoulder to toe. No shorts, short skirts, or shoes that do not cover the entire foot are permitted. It is required that you wear a full-length lab coat. This will adequately cover the upper body, but your legs, ankles, and feet must all be covered by your ‘street clothing’. Chemistry laboratory requires special precautions due to the hazardous nature of many chemical compounds. You need not be afraid of these compounds, but you must respect them and handle them with extreme caution. Due to the potential severity of injuries caused by chemicals being splashed in your face or on your skin, you will be REQUIRED to wear closed toe shoes, long pants/dresses, a lab coat/jacket and SAFETY GOGGLES while in lab. If you come to lab improperly attired, you will not be allowed to work until you "acquire" appropriate dress. Failure to wear safety goggles at all times will result in a deduction of points (at the instructor's discretion) from the day's work. Further safety procedures will be discussed during the first lab session.

**Laboratory reports:** Each experiment will have a post-lab report, due on Thursday mornings at 1210AM (essentially midnight on Wednesday) one week following the completion of that experiment. The specific instructions for these reports will be posted within Blackboard. Post-laboratory reports (including calculations) must be submitted online through the course Blackboard site. Failure to submit a post-lab for an experiment will result in zero credit for that experiment (no credit will be given for the pre-lab or data and observations sections in the absence of a submitted post-lab.)

It is your responsibility to complete AND submit the correct assignment before the due date. If you upload an incorrect document or are having technical difficulties, you must allow for reasonable time for your TA to respond or reset your assignment. Sending your TA an email before the due date without reasonable time for a response will result in a zero on the assignment, no matter the circumstance. You are encouraged to complete your assignments early in order to allow for any unexpected situations.

**Adjustments to laboratory scores:** The instructor will make every effort ensure that the grading of laboratory reports is consistent and fair. To this end, the instructors reserve the right to normalize the laboratory scores from the different laboratory instructors to the same average. Any such adjustment will be made at the end of the semester after all scores have been submitted. TA performance will be assessed throughout the semester with the goal of eliminating any necessity for these adjustments. Students are encouraged to bring any concerns about the equity of the grading process to the attention of the course instructor.

**Expectations for Student Effort**
As per WSU academic regulation 27, “Academic credit is a measure of the total minimum time commitment required of a typical student in a specific course. For the WSU semester system one semester credit is assigned for a minimum of 45 hours…. Achievement of course goals may require more than the minimum time commitment.” This guideline includes time spent in class.

This guideline essentially states that a student can be reasonably expected to spend two hours outside of class on assignments for every one hour spent in class, or ten hours per week outside of class for a course such as this. This is approximately the amount of time you should expect to spend on reading the textbook and doing assigned problem solving exercises.

**Policy on Late Assignments**
Late assignments are not accepted. It is your responsibility to pay attention to due dates and make sure assignments are completed on time. Rather than accepting late assignments for reduced credit, most assignment categories (homework, reading assignments, Learning Catalytics)
have more assignment points than what are counted toward your grade, which means you can miss assignments or make mistakes on them without significant grade penalty, so long as you still meet the maximum points that count toward your grade.

**Attendance Policy**

It is expected that students attend every class meeting. Attendance will not be taken in class, but the use of Learning Catalytics is effectively a check on attendance. Missing class will result in missing a Learning Catalytics assignment, and be counted towards your “dropped” points in that assignment category.

**Classroom Safety Statement**

Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the “Alert, Assess, Act” protocol for all types of emergencies and the “Run, Hide, Flight” response for an active shooter incident.

Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able).

Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the FBI’s Run, Hide, Fight video and visit the WSU safety portal.

**Academic Integrity:** Cheating or plagiarism in any form will not be tolerated. Cheating includes, but is not limited to: copying work OR allowing your work to be copied; use of unauthorized material at quizzes and exams, any communication between students during a quiz or exam, and actively looking at another student’s paper during a quiz or exam. Use of any electronic device other than an approved calculator during a quiz or examination is cheating. See WSU’s Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(3) and -404) and Standards of Conduct for Students, WAC 504-26-010(3) for full information.

All of the following will leave you open to an academic integrity violation in this class:

- Using a calculator with a full keyboard (or full keyboard mode) on an exam.
- Working with my lab partner on the post-lab and submitting the same answers.
- Sending my friend who is also in the course my assignment file so they can see how I did it.
- Letting my friend who is also in the course borrow my computer after I finished my lab assignment.
- Having a note card with chemistry info on it in my pocket during an exam.
- Wearing my iWatch or other smart watch during an exam.
- Having my cell phone, iPod, etc. in my pocket during an exam.

The first incidence of cheating will result in a score of zero for that assignment, quiz or exam. A second incident of cheating will result in an F (without the option to withdraw) for the course and possible dismissal from the University.

Note that all instances of cheating will be reported to the Office of Student Conduct, regardless of whether they result in an F for the class.

**Accommodations:** Reasonable accommodations are available for students who have a documented disability. If you need accommodations to fully participate in this class, please visit the Access Center. All accommodations **MUST** be approved through the Access Center (Washington Bldg, Room 217). Please notify the access center during the first week of class of any accommodations needed for the course. Late notification may cause the requested
accommodations to be unavailable. Please stop by or call 509-335-3417 to make an appointment with an Access Advisor. Further information is available at http://accesscenter.wsu.edu.

Class Policy on Late or Early Assignments
There is none. Assignments submitted late (without documentation of extreme extenuating circumstances) are awarded a zero. Early assignments are possible, but no extra credit is awarded for such efforts.

Student Learning Outcomes
At the end of the course the student should:

1. Have an understanding of the concepts, models, and theories that form the foundation of the fields of organic chemistry and biochemistry

2. Apply the standard algorithmic calculation procedures, individually and in combination, associated with these concepts, models, and theories.

3. Be able to describe, explain, and predict the behavior and interactions of substances on the atomic, molecular and macroscopic levels.

4. Be able to communicate in the basic vocabulary of organic chemistry and biochemistry, including the ability to transition between chemical names and chemical formula in a facile manner and the ability to describe organic reactions and their role in metabolic cycles.

5. Understand the relationship between molecular structure the physical and chemical properties of a substance.

6. Create procedures to solve problems by applying single and multiple concepts to new situations.

7. Apply chemical procedures and evaluate experimental results to develop an appreciation for the experimental basis of chemical knowledge and experimental methods through laboratory work, with special emphasis on qualitative analysis.

8. Write effectively about scientific experiments by describing laboratory procedures and results from both the student’s laboratory experience and articles from the scientific literature. Be able to evaluate and present a discussion of these results in the manner of a scientific report.
Assessment: SLO #s 1-7 will be assessed using examinations, quizzes, laboratory experiments and reports, homework, and in-lecture assignments. SLO #8 will be assessed using the quizzes and lab reports.