Heartland Community College
STEM–B Division
Course Syllabus and Policies
Fall 2018 Semester
Fundamentals of Chemistry (Lecture) CHEM 120-01

Catalog Description
Prerequisites:
- Completion of MATH 092 OR placement into MATH 093 OR completion of a college-level math class, AND
- Placement into college-level English OR concurrent enrollment in ENGL 099/ENGL 101, AND
- Placement into college-level reading

This is a one-semester survey of general, organic, and biological chemistry for students who plan to pursue a health-related profession or who have an interest in chemistry. An emphasis is placed on the relationship between chemistry and life through issues and examples from the health, medical, and environmental fields. A two-hour lab each week is used to reinforce the lecture material. Credit will not be given for both CHEM 120 and CHEM 161 (or equivalent).

Contact Hours
Credit hours: 4, over 16 weeks (August 20, 2018 – December 14, 2018)
Lecture hours: 2.5/week (MW, 9:00 – 10:15 a.m.)
Lab hours: 2/week (Variable days and times)

Instructor Information
Instructor: Dr. Nicola J. Burrmann
Phone number: (309) 268-8652
Email address: nicola.burrmann@heartland.edu
Website: http://employee.heartland.edu/nburrman
Office: ICN 2022
Office hours: MW, 12:00 noon – 1:00 p.m.; M, 3:00 – 4:00 p.m.; TR, 10:00 – 11:00 a.m.

Transferability Information
CHEM 120 fulfills four of the seven (A.A.) or eight (A.S.) semester hours of credit in the Life/Physical Sciences required for the A.A. or A.S. degree. It also satisfies the laboratory requirement for the A.A. degree. CHEM 120 should transfer as part of the General Education Core Curriculum described in the Illinois Articulation Initiative to other Illinois colleges and universities participating in the IAI. However, students should consult an academic advisor for transfer information regarding particular institutions. Refer to the IAI web page for information as well at www.itransfer.org.
Course Materials

Lecture


Required: Sapling Learning (online homework system); paid access is provided through www.saplinglearning.com

Required: Scientific or Graphing Calculator

Lab


Required: Scientific or Graphing Calculator

Course Outline

Lecture topics
- Measurements
- Atoms and elements
- Compounds and their bonds
- Chemical quantities and reactions
- Energy
- Gases
- Acids and bases
- Solutions
- Nuclear radiation
- Alkanes
- Unsaturated hydrocarbons
- Alcohols, ethers, carboxylic acids, esters, amines, and amides
- Carbohydrates, lipids, amino acids, proteins, enzymes and nucleic acids

Required Reading and Writing

This course will require approximately 500 pages of reading from both the lecture and lab textbooks, distributed over a 16-week period. Written analysis will be required in the form of problem sets, quizzes, exams, and laboratory reports.
Course Description and Learning Objectives
This is a survey course in General, Organic, and Biological Chemistry, designed to provide a
background in all of these areas for the student interested in the health-related professions by
examining issues in the health, medicine, and environmental fields. This course will cover
fundamental topics such as measurements and conversion factors, atomic and molecular structure
and function, and chemical reactions.

By the end of this course, students will have developed an understanding of the fundamental
concepts of chemistry, as well as critical thinking and analysis skills. While learning and
understanding the core concepts of chemistry will be vital for success, emphasis on exams, quizzes,
and problem sets will be placed on critical thinking and problem solving abilities. This means that
while approximately half of the questions on these assessments will be based directly from material
presented in class, many problems will ask you to use or interpret your knowledge in a new, related
way. This will be achieved by

- understanding and applying the metric system in conversion factors (PS/CT),
- determining atomic and molecular structure and electron configurations,
- distinguishing between ionic and covalent bonds and their molecular properties,
- completing and balancing chemical equations (stoichiometry) (PS/CT),
- understanding the relationship between temperature and energy,
- understanding the properties of gases and the relationships between them,
- distinguishing between different types of solutions and expressing their concentrations,
- identifying and comparing the properties of acids and bases
- identifying the types, uses, and effects of nuclear radiation,
- classifying compounds both by their functional groups and their IUPAC names,
- recognizing and applying the chemical reactions of classes of organic molecules (PS/CT), and
- determining the structure and importance of carbohydrates, lipids, and proteins.

The lab portion of this class will highlight concepts presented in lecture using practical techniques for
collecting, recording, analyzing, and explaining significant laboratory findings and conclusions in
written laboratory reports (PS/CT, CO, T). Specific aspects of the lab course will be detailed by the
lab instructor.

Essential Competencies
PS/CT (Problem Solving/Critical Thinking): Students identify and interpret problems to engage in
thinking that is informed by evidence. Alternatively, students apply strategies and procedures to
arrive at a workable solution.
CO (Communication): Students develop and present an effective message using various modalities
suitable to the topic, purpose, and audience.
T (Technology): Students appropriately use technology to solve problems, complete tasks, or
accomplish goals. Alternatively, students demonstrate effective adaptability to various
technologies.
**Lecture Schedule** – *Please note that this schedule is tentative and may change.*

<table>
<thead>
<tr>
<th>Day of</th>
<th>Chapter(s) Covered</th>
<th>Scheduled Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>M, August 20</td>
<td>1</td>
<td>Sapling Online Homework (Extra Credit) Training Assignment (Introduction to Sapling Learning) Due</td>
</tr>
<tr>
<td>W, August 22</td>
<td>1</td>
<td>Sapling Online Homework Assignment 1 Due</td>
</tr>
<tr>
<td>M, August 27</td>
<td>1</td>
<td>Last Day to Drop with Refund</td>
</tr>
<tr>
<td>W, August 29</td>
<td>1, 2</td>
<td>Labor Day – No Classes Meet</td>
</tr>
<tr>
<td>W, September 5</td>
<td>2</td>
<td>Problem Set 1 Due</td>
</tr>
<tr>
<td>M, September 10</td>
<td>2, 3</td>
<td>Sapling Online Homework Assignment 2 Due</td>
</tr>
<tr>
<td>W, September 12</td>
<td>3</td>
<td>Problem Set 2 Due</td>
</tr>
<tr>
<td>M, September 17</td>
<td>3</td>
<td>Problem Set 3 Due</td>
</tr>
<tr>
<td>W, September 19</td>
<td>3</td>
<td>Sapling Online Homework Assignment 3 Due</td>
</tr>
<tr>
<td>M, September 24</td>
<td>None</td>
<td>Exam 1 (Chapters 1 – 3)</td>
</tr>
<tr>
<td>W, September 26</td>
<td>4</td>
<td>Sapling Online Homework (Extra Credit) Training Assignment (Drawing Molecules) Due</td>
</tr>
<tr>
<td>M, October 1</td>
<td>4</td>
<td>Problem Set 4 Due</td>
</tr>
<tr>
<td>W, October 3</td>
<td>4</td>
<td>Sapling Online Homework Assignment 4 Due</td>
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<tr>
<td>M, October 8</td>
<td>5</td>
<td>Problem Set 5 Due</td>
</tr>
<tr>
<td>W, October 10</td>
<td>5</td>
<td>Quiz 2</td>
</tr>
<tr>
<td>M, October 15</td>
<td>5, 6</td>
<td>Sapling Online Homework Assignment 5 Due</td>
</tr>
<tr>
<td>W, October 17</td>
<td>6</td>
<td>Problem Set 6 Due</td>
</tr>
<tr>
<td>R, October 18</td>
<td>None</td>
<td>Midterm Grades Due Online ‡</td>
</tr>
<tr>
<td>M, October 22</td>
<td>6</td>
<td>Problem Set 7 Due</td>
</tr>
<tr>
<td>W, October 24</td>
<td>7</td>
<td>Quiz 3</td>
</tr>
<tr>
<td>M, October 29</td>
<td>None</td>
<td>Exam 2 (Chapters 4 – 6)</td>
</tr>
<tr>
<td>W, October 31</td>
<td>7</td>
<td>Sapling Online Homework Assignment 6 Due</td>
</tr>
<tr>
<td>M, November 5</td>
<td>7</td>
<td>Problem Set 8 Due</td>
</tr>
<tr>
<td>W, November 7</td>
<td>8</td>
<td>Last Day to Withdraw</td>
</tr>
<tr>
<td>M, November 12</td>
<td>8</td>
<td>Quiz 4</td>
</tr>
<tr>
<td>W, November 14</td>
<td>8</td>
<td>Sapling Online Homework Assignment 9 Due</td>
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<tr>
<td>M, November 19</td>
<td>8, 9</td>
<td>Problem Set 9 Due</td>
</tr>
<tr>
<td>W, November 21</td>
<td>None</td>
<td>Sapling Online Homework Assignment 8 Due</td>
</tr>
<tr>
<td>M, November 26</td>
<td>9</td>
<td>Thanksgiving Break – No Classes Meet</td>
</tr>
<tr>
<td>W, November 28</td>
<td>None</td>
<td>Quiz 5</td>
</tr>
<tr>
<td>M, December 3</td>
<td>10</td>
<td>Sapling Online Homework Assignment 9 Due</td>
</tr>
<tr>
<td>W, December 5</td>
<td>10</td>
<td>Exam 3 (Chapters 7 – 9)</td>
</tr>
<tr>
<td>W, December 12</td>
<td>None</td>
<td>Comprehensive Final Exam (8:00 – 9:50 a.m.)</td>
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</tbody>
</table>
Method of Evaluation (Grading System)

Grades will be determined by a combination of problem sets, online homework, quizzes, exams, and lab work (“assessments”). Points will be distributed as follows:

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Number of Each Assessment</th>
<th>Points Possible (Each)</th>
<th>Total Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Sets</td>
<td>10</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>Online Homework</td>
<td>10</td>
<td>15</td>
<td>150</td>
</tr>
<tr>
<td>Quizzes</td>
<td>5*</td>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>Lecture Exams</td>
<td>3</td>
<td>100</td>
<td>300</td>
</tr>
<tr>
<td>Lecture Final Exam</td>
<td>1</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Lab Activities †</td>
<td></td>
<td></td>
<td>200</td>
</tr>
<tr>
<td><strong>Total Points Possible</strong></td>
<td></td>
<td></td>
<td><strong>1000</strong></td>
</tr>
</tbody>
</table>

* Lowest quiz score will be dropped.
† For specific distribution of points, see the syllabus distributed by the lab instructor.
‡ A student will be withdrawn from the course by the course instructor if that student has been absent for two consecutive weeks, has more than six total unexcused absences, or has completed fewer than 60% of the course assessments given by the date that midterm grades are due.

Grades will be based on a set scale:

A: \( \geq 85.0\% \)   B: 75.0 – 84.9%   C: 65.0 – 74.9%   D: 60.0 – 64.9%   F: < 60%

An incomplete grade may be given to a student who, by the withdrawal date, can reasonably be expected to pass the course. Incompletes may be granted only when justified by extreme circumstances (e.g., serious illness, accident, death or serious illness in the immediate family). Incomplete grades are not given for such reasons as unjustified failure to appear for the final examination. A written agreement, outlining the requirements to be met, must be signed by the instructor and the student. The agreed-upon requirements must be completed no later than the end of the following semester (spring semester for incompletes granted during the fall, and the following fall for incompletes given during the spring and summer semesters). By the agreed-upon date, the instructor will assign a grade or the incomplete will be changed to an F if the requirements are not completed.

Attendance and Make-Up Policy

Attendance for the lecture portion of the course is strongly recommended. Attendance for the lab portion of the course is required.

If you will miss class on the day that a problem set is due, the problem set must be submitted to the course instructor before the missed class. Most online homework (with exception of Assignment 10) can be completed after the indicated due date; however, a 20 % penalty for the assignment will be assessed per calendar day after the date indicated on the course schedule. Extra credit online homework assignments will not be accepted after the indicated due date. Quizzes and exams cannot be made up after their scheduled date, except under highly extenuating circumstances, as approved by the course instructor. If a quiz cannot be made up prior to the missed class period, this will count as your dropped quiz. If you know in advance that you will miss a quiz or an exam, talk to the course instructor to schedule to take your assessment before the scheduled date.
Please remember to either turn off or put your phone into silent mode before the start of each lecture and lab, in order to minimize disruptions. The course instructor reserves the right to dismiss repeat offenders from a class period after an interruption. *Cell phones are not permitted during any quiz or exam time. Any student who does not keep their phone appropriately stored during these times will receive a score of 0 (zero) points on that quiz or exam. Any emergency circumstance in which a student may be required to answer his or her phone during these times must be discussed with the course instructor before the quiz or exam period begins.*

**Homework, Problem Sets, Quizzes, and Exams**

Ten problem sets will be given out during the semester, and these should all be completed for course credit. Each of these problem sets will contain a small number of problems to be solved. In order to receive credit for these problem sets, both the correct answer and complete, detailed work must be shown.

Online homework assignments through www.saplinglearning.com are required for the course, and should all be completed for course credit. One assignment will be given for each covered chapter in the textbook. Each of these assignments contains 15 randomized questions that will provide you with feedback. You are allowed unlimited attempts for each problem, but each incorrect answer will result in a 5% reduction of credit for that problem. All assignments can be accessed beginning on the first official class day. However, each assignment must be completed by 11:55 p.m. Central time on the due date indicated in the course calendar to receive maximum credit. Completing an assignment after this time will result in a 20% reduction of credit per calendar day. Additionally, four supplemental extra credit assignments, designed to familiarize you with the Sapling Learning system, will be offered. Extra credit assignments cannot be completed after the due date indicated in the course calendar. Follow the steps below to create an account, sign up for the module associated with this course, and provide payment. Once you have registered and enrolled, you can log in at any time to complete or review your homework assignments. If you have any technical problems during set-up or throughout the term or experience grading issues, send an email to gob@saplinglearning.com explaining the issue.

1. Go to www.saplinglearning.com. Under the “Students” header, near the center of the page, click on “Login or Create Account”, and select “US Higher Ed” in the pop-up menu that appears.
2. If you already have a Sapling Learning account, log in and skip to Step 4.
3. If you do not already have a Sapling Learning account, click on “+ Create an Account.” Supply the requested information, making sure to enter Heartland Community College as your Institution, and click “Create My Account.” Check your email for a message from Sapling Learning and click on the link provided in that email. If an email does not arrive within several hours, check your spam filter.
4. Log in and find this course in the list.
   a. Expand the subject titled “General, Organic, and Biochemistry.”
   b. Expand the term titled “Semester 1.”
   c. Click on the link that reads, “Heartland Community College – CHEM120-01 – Fall2018 – BURRMANN.”
5. Select a payment option and follow the remaining instructions.

*Note that Sapling works best when accessed using Google Chrome or FireFox browsers! Using Internet Explorer or Safari will result in errors, so please avoid using these browsers.*
The textbook and internet are acceptable resources of information for problem sets and online homework. While working on these assessments with a group of peers is acceptable, be sure to record all answers in your own words – do not plagiarize! (Please see next section on Academic Integrity and Plagiarism). Working together with peers means that all group members should collaborate in each step of the problem-solving process until an answer is determined. Alternatively, all group members could work independently and then compare work and answers, then discuss which one is likely correct. However, it is unacceptable to directly copy someone else's answer without understanding that answer and how it was derived.

Quizzes will be given at the beginning of class periods, with 20 – 40 minutes devoted to the quiz, depending on the content and difficulty level. One full class period will be devoted to each exam. Course exams and quizzes will consist of questions in a variety of formats, including (but not limited to) true/false and free response. Minimal partial credit will be given for true/false questions. Partial credit will be given on the free response questions, so be as complete as possible! Your lowest quiz score will be dropped at the end of the semester.

Selected homework problems assigned for each chapter in the textbook are completely optional. No grades or point values will be assigned to homework problems. The content of these questions will usually be highly reflective of the content included in quiz and exam questions. Therefore, completing the supplemental homework is strongly recommended, as doing so will give you an opportunity to demonstrate your mastery of topics presented in class.

Laboratory Information
For specific laboratory information, such as point distribution and schedule, see the syllabus distributed by the lab instructor.

Academic Integrity and Plagiarism
All work submitted for grading should be solely your own. While working on homework with a group of peers or using a variety of resources (textbook, peers, internet) for studying or lab work is strongly encouraged, plagiarizing information will not be tolerated. Plagiarism is defined as taking another person's ideas or work and presenting them as your own. This can include copying or paraphrasing text from another source, whether it be printed (textbook or internet) or verbal (peer). If other sources are used in the completion of your lab assignments (physical data, pre- or post-lab questions), cite your sources with a textbook title and page number or website address.

Plagiarism is considered a serious academic offense and violates the fundamental principle of academic integrity. Heartland Community College allows for a variety of disciplinary responses to plagiarism or other examples of academic misconduct, including course failure, suspension, or expulsion from the College. Examples of academic misconduct can include, but are not limited to, plagiarism, cheating, falsification or misrepresentation of data or academic records, and assisting others in acts of academic misconduct. Further examples and definitions for academic misconduct violations can be found in the college catalog.

Any student found to be cheating on any assessment will receive a score of 0 (zero) points on that assessment. The penalty for cheating on a second assessment will be dismissal from the course with a failing grade (F). A letter may also be placed in the student's permanent file at
Heartland Community College. Note that these decisions can be appealed based on the appeals process found in the Heartland Community College Student Handbook.

**Tips for Success**

Study regularly and often, ideally every day. A large amount of material will be presented, and the difficulty of these concepts will vary. Reading the corresponding sections of the textbook and completing supplementary problems should greatly improve understanding of the material discussed in class.

Do not “cram” right before a quiz or exam! Cramming will only allow very minimal amounts of memorized information to be stored into your memory. As a majority of the quiz and exam content will be based on giving free response explanations or extensions of material presented in class, it is highly important that you learn not only the information itself, but also *what it means* and *how it's useful*.

When working through suggested homework problems, do not look at the solutions until you have worked through the problem to the best of your ability and written down an answer. It's extremely easy to read a problem, immediately look at the answer, and think “That makes sense.” Taking the time to work through the problems and write down answers will serve as superior learning tools to show how much of the course content is truly understood.
Support Services
Take advantage of the support services offered at Heartland Community College, such as the library, tutoring center, and testing center:

Testing Services (located in Student Commons Building 2001)
Testing Services provides a secure testing environment for students who are enrolled in online, hybrid, and other distance learning courses; have a documented disability; or need to take a make-up exam. Testing accommodations for students having documented disabilities must be arranged by the student through Disability Support Services. Testing Services will only administer exams at the request of the instructor. For more information, please call (309) 268-8050.

Counseling Services
Counseling Services provides confidential and professional counseling for both emergency and personal issues. Services also include referrals to local community resources and support for students on academic probation. For more information, please call (309) 268-8318.

Services in Academic Support Center (Raab Road campus)

Library
The library provides fast and free access to credible information from a full range of resources including books, online journals, videos, newspapers, online music, class reserves, and inter-library loan. Individualize research by appointment or come in anytime. See the library tab in myHeartland, email library@heartland.edu, or call (309) 268-8292 for details.

Tutoring Services
Tutoring Services provides tutoring in various forms at no cost to Heartland students in Normal, Pontiac, and Lincoln. Tutors are available at convenient times throughout the week. Study groups are also available by request. For more information about services available at each location, please call (309) 268-8231 (Normal), (815) 842-6777 (Pontiac), or (217) 735-1731 (Lincoln).

Disability Support Services
Disability Support Services (DSS) ensures that students with disabilities have equal access to the college’s programs, services, and activities through the provision of reasonable accommodations as mandated in Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. DSS offers a wide range of services to support students with disabilities, including: assistive technology, document conversion services, personnel, classroom and testing accommodations. Students with a documented disability who wish to discuss academic accommodations should call (309) 268-8259 for details.

Open Computing Lab
The open computing lab provides free computing for HCC students at convenient times throughout the week. The computer lab is staffed by trained lab assistants and offers the use of approximately 70 computers, a scanner, a laser printer, and an electric typewriter.
Writing Lab
The writing lab provides guidance for writers on assignment comprehension, critical thinking, and the stages of the writing process. The writing lab is staffed by English faculty and tutors with years of experience working with students on writing. In every session, supportive staff work with writers to explore and develop their own ideas as appropriate to the needs of their readers and to learn the rhetorical strategies necessary for effective communication. For more information, please call (309) 268-8231.

Services in Community Commons Building (Normal Campus)

Academic Advising
Academic advisors help students develop a plan of study, review degree/program requirements, discuss transferability of courses, and provide career exploration support. For more information, please call (309) 268-8033. Academic advising services are also available at the Lincoln and Pontiac sites.

Career Services
Career Services assists students to determine career goals, develop employability and job search skills and connect with potential employers in preparation for employment and career transitions. Through the Online Career Center at www.collegecentral.com/heartland students can learn about area employment opportunities, prepare and post resumes and find a host of free career-related resources. The job shadow and internship programs offer access to relevant work-based learning opportunities that enhance academic experiences and support students in their career pursuits. For more information, please call (309) 268-8034 or email Career.Services@heartland.edu.

Financial Aid Office
The financial aid office provides information on programs and types of financial aid available to students. For more information, please call (309) 268-8020.

Transcripts
Official and unofficial transcripts may be obtained in the student records office. Transcripts may also be obtained at Heartland’s Lincoln and Pontiac sites. Official transcripts must be requested in writing. The form is available in the student records office or online at online http://www.heartland.edu/transcripts/index.jsp. Unofficial transcripts are available to print online through IRIS.