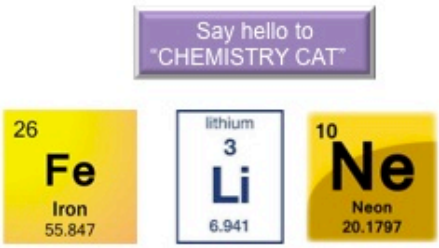
CHEM 1000: INTRODUCTION TO CHEMISTRY
3 Credit Hours
Bowling Green State University, FIRELANDS
SUMMER 2016



INSTRUCTOR INFORMATION Dr.
Subhalakshmi (Subha) Nagarajan
Office Phone: (419) 372-0646
Email: nsubhal@bgsu.edu
Availability:
Online: I check my email several times during the day (Mon- Fri) and will respond to all emails within 24 hours. Email sent over the weekend may get a response during the weekend, but most likely, I will respond on Monday.
Face-to-Face/phone: Please feel free to contact me to set up a face-to-face appointment or phone conference.
If you have questions of a general nature, please post them on the "General Discussion" board which is viewable by other students as well.

COURSE DESCRIPTION

This course examines basic chemical concepts and helps students understand and appreciate the important role of chemistry in numerous applications. This course is not counted towards a chemistry major or minor. There is no laboratory accompanying the course. This course is applicable to the BG Perspective (general education) natural sciences requirement.

COURSE OBJECTIVES

The course is designed to help students gain understanding of the fundamental principles of chemistry with an introduction to organic chemistry and biochemistry. The course aims to develop/strengthen student skills in problem solving and analytical reasoning.

LEARNING OUTCOMES

- Classify matter as elements, compounds and mixtures
- Recognize the importance of measurements in chemistry and perform simple unit conversions
- Describe and identify physical and chemical changes
- Describe an atom and appreciate the importance of sub-atomic particles in the atom
- Understand the structure and composition of periodic table
- Learn to balance simple chemical equations
- Understand importance of chemical bonding and learn to predict shapes of molecules
- Identify classes of organic compounds and learn to name simple hydrocarbons
- Identify three forms of nuclear radiation and describe the process of nuclear change
- Describe properties of gases and predict their behavior
- Define and determine pH
- Describe properties of acids, bases, salts and buffers.

- Define and identify oxidation and reduction reactions
- Learn about different kinds of attractive forces between molecules and their impact on properties.
- Develop an appreciation for the impact of chemistry on life.
- Demonstrate proficiency in solving mathematical problems related to basic chemistry
- Develop problem solving skills and think critically and creatively
- Awareness and knowledge about various key environmental issues and their impact on society

BGP learning Outcomes

- Describe how natural sciences can be used to explain and/or predict natural phenomena
- Identify misconceptions associated with the specific scientific discipline
- Explain simple quantitative data and its limits relative to the study of science
- Demonstrate the application of simple quantitative and qualitative data in the scientific process
- Solve problems using one or more of the logical approaches of science
- Reflect on the relevance of science to one's everyday life.

COURSE DELIVERY METHODS

CHEM 1000 is web-based**.** You are not required to attend class at regular times, however it is important that you meet due dates and deadlines for assignments, discussions, quizzes and exams. Communication will be through announcements posted on canvas and emails. You will be required to take three proctored mid-term exams and a comprehensive final examination. All mid-terms and final exam must be taken to pass the course. Please see under "Course structure" for more details.

REQUIRED RESOURCES AND TEXTBOOK:

- Access to an Internet connection **(High Speed)**
- An BGSU email account
- **Optional textbook:** Chemistry in Focus, A Molecular View of Our World, 6th edition
  Author: Nivaldo Tro
  Publisher: Brooks/Cole/Cengage Learning
  The textbook is available at the BGSU bookstore http://www.bgsu.edu/bookstore.html
- A scientific calculator is needed for the course and is available at the school bookstore. Contact the instructor if you need help with choosing the right calculator.
- **Required Software:** Online Web Learning (OWL). Look under the tab assignments on the canvas page for step-by-step directions to register for OWL. *SOFTWARE PURCHASE IS MANDATORY AS ALL ASSIGNMENTS ARE DONE ONLINE. PURCHASE OF SOFTWARE ALLOWS YOU FREE ACCESS TO EBOOK.*

COURSE PREREQUISITES:

There are no required course prerequisites for CHEM 1000. Basic algebra skills and some high school science are needed in this course.

COMPUTER SKILL PREREQUISITES

To be successful in this online class you should be comfortable using a computer for the following functions:

- using email for communication
- sending an email attachment
- navigating the Internet
- downloading appropriate plugins
- using an Internet search engine
- Competence in using BGSU's online learning management system "Canvas"

SYSTEM REQUIREMENTS

The computer you use for the course should have the requisite software required for canvas. More information on Canvas can be found on the web-links listed below

Canvas guides:

Computer specifications:
http://guides.instructure.com/s/2204/m/4214/l/82542-what-are-the-basic-computer-specifications-for- canvas

Browser requirements:
http://guides.instructure.com/s/2204/m/4214/l/41056-which-browsers-does-canvas-support

BGSU Canvas Student resource page:
http://www.bgsu.edu/provost/canvas-implementation/student-resources.html

COURSE NAVIGATION:

Introduction to chemistry is a three-credit web-based course built around twelve chapters in the Chemistry in focus textbook, 6th Edition. The course comprises of twelve modules based on the chapters in the textbook. To begin, click on the "Modules" link in the menu on the left of your screen. Review the "Course Information", and then find "**START HERE - Chapter 1: Chemistry: Molecular reasons**". Each Chapter can be navigated through by clicking the "Next" button at the bottom of the screen. To go back, click the "Previous" button. To view the Chapters and module topics, click on the "Modules" link.

ATTENDANCE/PARTICIPATION

Attendance (regular participation in the online classroom) is essential for being successful in the course. Announcements will be posted frequently on canvas or communicated via e-mail. You should check the Announcement Page and your e-mail regularly in order to access course related announcements.

It is the student's responsibility to actively participate in each discussion board as mentioned in the "evaluation methods" and to keep up with assignments, quizzes and exams. You are expected to log on to the course site 2-3 times per week and spend 7-9 hours per week doing course related activities. This online class demands that the student be self-motivated and self-disciplined. The online course is available at all times.

COURSE STRUCTURE:

For each module, you will study the textbook chapter and the accompanying instructor presentation and web links which will be available to you. At the end of each module, you can test your understanding of the concepts by doing practice problems which will be posted online. Solutions to these practice problems will also be posted online. Review sheets summarizing the important concepts will be made available to you.

Course textbook:

The textbook provides several learning activities designed to enrich your knowledge in chemistry as described below:

- *Examples and Your Turn Exercises:* Worked examples in the text demonstrate application of simple concepts in problem solving. Each worked example is accompanied by one or more "Your Tum" exercises to help you check your understanding of the material. I will point to specific problems to study and work out during the course. Study each example and solution, and then work through the "Your Turn" exercise on your own. Check your solutions with the answers in Appendix 3.
- *Chapter Summaries and Key Terms:* Summaries and key terms are located at the end of each chapter.
- *Self-Check Boxes:* These questions are located within the chapters to allow you to track your understanding of chapter material. The answers are located at the end of each chapter.
- *Other:* Details of Significant Figures are found in Appendix 1. Definitions of many key terms are found in the Glossary at the end of the book. Periodic Table is located in the front cover and an alphabetical listing of the elements is located on the back cover of the text.

EVALUATION METHODS

Online discussions:

I will post questions on the discussion board for some modules. The discussions are aimed to connect important concepts you learnt to their application in real life.

Participation in online discussions involves two distinct activities: an initial response to a posted question and at least two subsequent comment on your classmates' response. Participation should be relevant to the content discussed and should aim to add value and advance the discussion further. Comments such as "I agree with him/her", "Ditto", "Yes" are not considered to be value- added participation. When you agree/disagree with classmates or instructor, support your statement with adequate facts and/or examples. You will be evaluated on the quantity and quality of your participation. Responses and comments should be proofread, edited, professional and respectful. Participation in these discussions will account for 5% of your total grade.

Online assignments:

At the end of each module, you are required to finish the assignment based on the concepts learnt in the module. Online assignments are done using OWL. OWL will allow you to gain mastery over concepts discussed in every chapter by providing example problems for you to solve. There is no time-limit for taking the assignment and you can take/retake the assignment as

many times as you need, till you master the concepts. However, you have to finish all the content areas within the assignment to get full credit. Online assignments account for 10% of your grade

Online quizzes:

Online quizzes are required for some modules as listed in the tentative course schedule. After finishing your assignments for the module, please take the online quiz using canvas. Both multiple- choice and descriptive questions will be on the quiz. Quizzes account for 5% of your final grade. Please note that the online quiz is a timed activity. Make sure that you are working from a computer with a reliable internet connection before you start your work on the quiz. If you experience any difficulties when you take the quiz, notify me via email or leave a voicemail on my office phone.

Midterm Exams

There will be three written, closed-book exams, which need to be taken in a proctored environment ("Refer to tentative class schedule at the end of the document for exact dates"). Proctored exams can be taken at the teaching and learning center at BGSU Firelands at predetermined times which will be posted online. You will have one hour to complete each exam. You are allowed to use a calculator but you may not use cell phones or other devices. If you are not local, you must schedule your exams at a certified testing center. All testing fees that may be charged are the responsibility of the student. Three exams account for 48% of your final grade. The exams will include multiple- choice and descriptive questions.

Final Exam:

The final exam will be comprehensive and cover all modules discussed in the course and has to be taken in a proctored environment ("Refer to tentative class schedule at the end of the document for exact dates"). You will have two hours to complete the final exam which will account for 20% of your grade. The final exam will include multiple-choice and descriptive questions.

Projects:

Students will be assigned to work on projects relating concepts learned in the course to real-life applications. More details will be provided on the first day of classes. Projects will account for 10% of your grade.

Extra credit:

There will be opportunities for extra credit. Please check announcements posted on canvas periodically.

SCHEDULING PROCTORED EXAMS:

You should take the three midterm and final exams during the designated time period at the BGSU Firelands Teaching and Learning Center (TLC) or at a certified testing center. If you are a student at the BG campus, you can take the proctored exam at the Learning Commons. Please email me for further information.

Please call the TLC to schedule your appointment to take the exam. Bring a picture ID when you come to take the exam The TLC is located in Room 230 in the George Mylander

Building on BGSU Firelands Campus. Phone number is 419-433-5560 ext. 20748.

TLC weblink: http://www.firelands.bgsu.edu/offices/tlc/index.html

Fall/Spring Semester hours		**Summer semester hours**	
Monday – Thursday	7:30 am -8:00 pm	Monday – Thursday	8:00 am – 6:00 pm
Friday	8:00 am – 5:00 pm	Friday	8:00 am – 5:00 pm
Saturday and Sunday	Closed	Saturday and Sunday	Closed

If you are planning on taking the exams at a certified testing center, it is your responsibility to notify the instructor at least two weeks before the testing date to provide the instructor with sufficient time to mail the exams to the certified testing center. If you need help identifying a certified testing center, please email me.

GRADING

Your percentage in the course will be calculated based on the table shown below:

Online discussion board participation	5%
Online assignment(s)	10%
Online quizzes	5%
Exams (I, II, III) (proctored)	48%
Projects	10%
Extra credit	2%
Comprehensive final exam (proctored)	20%

You will receive a score of zero for any work not submitted. The Grading scale is as follows:

A	≥ 90%
B	≥ 80%
C	≥ 70%
D	≥ 60%
F	Below 60%

MAKE-UP EXAM POLICY

There are no-make up assignments or quizzes. The quizzes and assignments have a generous window of availability. Please make every effort to adhere to these deadlines. If you have extenuating circumstances which prevent you from taking the exam, please contact me prior to the exam. If you have computer problems while taking the quizzes/assignments, please contact me via telephone or email. Deadlines for submission of quizzes/assignments will be posted well-ahead of time. There is no partial credit for submitting assignments or quizzes late submissions.

ACADEMIC HONESTY

The academic honesty code as outlined in the BGSU Firelands student handbook will be strictly enforced. Any form of cheating will not be tolerated.

The three exams and the final are proctored, closed book with no notes allowed. Assignments are not proctored. You may use your class notes, presentation and textbook but you

are not allowed to use the internet/other resources to complete the assignment. Online-quiz is closed-book. You may not use textbook, internet/other resources to finish the quizzes.

What is considered cheating?

- Looking up any answer or part of an answer on the internet while taking the online assignment/quiz or using any other source to find the answer on a closed book/closed note exam.
- Copying or pasting your responses from any other online sources into your online tests and discussions. This includes copying/pasting from other documents/spreadsheets written by your friends or other people
- Plagiarizing answers (representing the words/ideas of other writers as if they are your own without appropriate references). All writing submitted in the course must be original and/or provide suitable citations. For example, copying and pasting a paragraph from Wikipedia (or some other online website) without clearly mentioning the source it came from is plagiarism.
- Asking your friends/family to assist you by any means while you take the exam/assignment/quiz is cheating
- Copying any part of the exam/quiz to share with other students
- Telling the instructor that you need another attempt to complete the quiz/assignment because your connection to the Internet was interrupted, when it is not true.
- If there is evidence that you have cheated or plagiarized, you will fail the course.

GUIDELINES FOR SUCCESS IN CHEMISTRY 1000

The study of chemistry requires different approaches and techniques unlike some other subjects. You have principles and concepts to understand, formulae to memorize and definitions to learn. Concepts in each module are built upon content discussed in previous modules. A significant portion of what you learn in the first few modules is used in the repeatedly in the remainder of the course.

Steps to success:

1. Reading the textbook: Read the chapter in the textbook before the beginning of each module. This helps to familiarize you with the content of the module and helps you focus your attention on concepts/problems you did not understand. After going over the instructor presentation and notes, go back and read the chapter again
2. Do not procrastinate: Do not wait till the night before the due date to start studying. Cramming does not work in chemistry. Plan to spend 7-9 hours each week going over the presentation, doing the practice problems and reviewing materials posted online. Short repeated exposure transfers information into long term memory. It is important that you spend adequate time to learn concepts in the first few modules. These concepts are used throughout the course.
3. Develop your problem-solving skills: Sharpen your basic mathematical skills. One of the primary

reasons students have trouble with Chemistry is that their math skills are weaker than they realize. Being able to use the scientific calculator comfortably is important.

4. Practice makes perfect: Spend time doing problems at the end of every chapter. Answers to problems are given at the end of the textbook. Each module in the course will list a number of end-of-chapter problems for you to practice. Solving equations and practical problems should be a feature part of your study routine for success in this course.
5. Being an active Participant: Please post any questions you have in the general discussion board.

   Someone else may have the same question and you could be helping them out as well.
6. Complete assignments and quizzes: The assignments and quizzes are a great way to test your understanding of the module and identify areas you need to work on. Make sure you complete these on time.
7. Get Help: If you feel that you are getting stuck and do not understand any particular topic, please feel to contact me over the phone or via email. If you live close to BGSU Firelands, there is tutoring available for this course at the teaching and learning center. Get help early on the course.
8. Exam reviews: Exam reviews will be made available to you before each exam. Take the time to work on these reviews. The reviews are a great way to test your understanding of the subject. Solutions to the review will be posted online

DISABILITY STATEMENT: *If you are a student with a disability, it is your responsibility to notify the instructor during the first week of classes in order to ensure proper accommodations can be made in a timely manner.*

TENTATIVE SCHEDULE

Note: This class syllabus is tentative. The instructor reserves the right to make substitutions, additions or subtractions to the class schedule.

Dates	Module/chapter
6/13	Chapter 1: Molecular reasons & Chapter 2: The chemist's toolbox
	Assignment for Chapter 1 and 2 (due 6/20) 11:59 pm
	Quiz for Chapter 1 and 2 (due 6/20) 11:59 pm
6/20	Chapter 3: Atoms and elements
	Assignment for Chapter 3 (due 6/27) 11:59 pm
	Quiz for Chapter 3 (due 6/27) 11:59 pm
	Discussion for chapter 3 (due 6/22) at 11:59 pm
6/27	Chapter 4A: Molecules, compounds and Chemical reactions
	Proctored EXAM I (Chapters 1, 2 and 3) (available from 6/27-6/29)
	No assignments or quizzes due for the week
7/5	Ch. 4B: Molecules, compounds and chemical reactions & Ch. 5: Chemical Bonding
	Assignment for Chapter 4 and 5 (due 07/12) 11:59 pm
	Quiz for Chapter 4 and 5 (due 07/12) 11:59 pm

07/11	Ch. 6: Introduction to Organic Chemistry and Ch.8 Nuclear chemistry
	Assignment for Chapter 6 (due 07/18)
	Quiz for Chapter 6 (due 07/18)
	Discussion (due 07/14)
07/18	**Proctored Exam II (Chapters 4, 5, 6) (available from 07/18-07/20)**
	Ch. 11: The Air around us & Ch.12: the liquids and solids around us
	Assignment for chapter 11 and chapter 12 (due 07/25)
	Quiz for chapter 11 and chapter 12 (due 07/25)
	Discussion (due 07/25)
07/25	**Proctored Exam III (Chapters 8, 11 and 12)**
	Ch.13: Acids & bases, Ch. 14: Oxidation & reduction Ch. 16: Biochemistry & Biotechnology
	Assignment for chapter 13 (due 08/01)
	Quiz for chapter 14 (due 08/01)
08/01	Work on projects; due 08/05/16 at 11:59 pm
	Comprehensive final exam (available 08/01-08/03)