

## VC210 CHEMISTRY

**Syllabus Course Profile** (for updates & latest version check CANVAS online)

**Lecture Hours:** **Sec.1** Mon 10:00-11:40AM F200, Wed 8:00-9:40AM F310, F\*(odd week) 8:00-9:40AM F200

**Sec.2** Mon 14:00-15:40PM F200, Wed 10:00-11:40AM F310, F\*(odd week) 10:00-11:40AM F200

### **Course Description:**

This General Chemistry VC210 course is intended to satisfy the one-term chemistry requirement for students interested in science, or as a natural science elective for non-science concentrators. This course may also be used as the first term in a four or more term chemistry sequence for science concentrators and pre-professional students. This course is designed to teach chemical principles to science and engineering majors. Along with VC211, this course fulfills the general education requirement for natural sciences. Chemistry VC210 content provides an introduction to the major concepts of chemistry, including the microscopic picture of atomic and molecular structure, molecular geometry & bonding theories (Lewis, VSEPR, MO), periodic trends in the chemical reactivity, the energetics of chemical reactions, reaction kinetics & thermodynamics, property of gases & liquids, phase diagrams, and the nature of chemical equilibria, and electrochemistry. Students will be introduced to the fundamental principles of modern chemistry, the descriptive chemistry of the elements, and to the underlying theories that account for observed macroscopic behavior. The students will learn to think critically, examine experimental data, and form generalizations about data as chemists and engineers do. Derivatives & exponential functions in kinetics & thermodynamics with experimental data manipulation: Equations for reaction order and Arrhenius reaction rate constant, saturated temperature & vapor pressure, and Gibb's-Helmholtz (temperature effect on chemical equilibria).

This course is structured around the three main parts---Structure of materials, thermodynamics and aqueous solution and electrochemistry. They are interrelated and interdependent. Based on the general aims of the education, this course is expected to emphasis on the educational experience of an active, practical and student-centered nature. On the other hand, any science course in a top-level university should reflect the changing needs of students, the high-speed development and the growing significance of science in its field. Additionally, the course is designed to incorporate the following components:

- science for action, or the applications of science and its interface with technology
- science, which is concerned with issues – political, social and economic – of concern to citizens.

In addition to homework and “Mastering Chemistry” online assignments, class examinations, attendance & class participation, it is essential for students to learn some of above skills through communication using power point presentations and writing reports on selected or assigned special topics about modern materials and advanced chemistry. Some of the topics will be discussed in the class to understand how to put the science into action. The presentation & report are assigned in the middle of the course by dividing students into groups of 4-6students each and the final presentations and reports are due as scheduled later on CANVAS.

**Class Meetings:** consist of **lectures** and **discussion sections**. In Chemistry VC210, you will attend lectures **three times per week on odd weeks & two times per week on even weeks**; the lecture schedule is attached at the end of this syllabus. Check CANVAS for class location & times of lectures. Regular class attendance is expected. In addition, you will meet **once per week in a recitation discussion class** of about 40 or 50 students, each led by a Teaching Assistant (TA), who will go over the problems occurring in assignments in more detail and help prepare you for the midterm and final exams.

**Prerequisites:** 3 years high school math, high school chemistry

**Instructor:** Dr. Thomas A. Hamade, JI room 202 Tel: 86-021-34207215.

**Office hours of instructor and TAs:** Office hours located in JI room 202, **Mon. 12:00PM - 13:40 PM & Wed. 12:00PM - 13:40PM**. TA-s schedule is posted online on CANVAS and **each TA** will hold about 2hours/week as office hour offered in multiple of ways such as face-to-face Q&A & email (see last page). It is impossible for instructor to respond to each student email, please do not email instructor, instead you are **encouraged to visit the instructor face-to-face** during office hours or by appointment.

**Recitation schedule:** Students in Section 1 & Section 2 of VC210 will be divided randomly into 6 recitation sections (about 50 students per recitation section) and each will be assigned one TA. Each TA will schedule **90 minutes recitation** session per week during the evening, where you can get one-on-one help from the TA (it does not have to be the same TA who leads your discussion recitation section). **You must attend your TA recitation session once a**

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**week** (Check CANVAS for recitations schedule). Also, your assigned TA will assist you on course matters such as recitation sessions, grading, assignments, schedule etc. Refer any unresolved issues to instructor immediately.

**Required textbook & course materials:**

1. **Textbook:** Chemistry-The Central Science (Theodore L. Brown; H. Eugene LeMay, Jr.; Bruce E. Bursten, et al.), Pearson International edition (Pearson Prentice-Hall, Inc.), 13<sup>th</sup> Global Edition 2016 ISBN 13: 9781292057712, Electronic Copy ISBN: 9781292067254 (<http://www.pearson.com.au/products/?seoe=&&sq=9781292057712>).
2. **Calculator** capable of addition, subtraction, multiplication, division, powers, roots, and logarithms will be *required* for homework assignments, as well as midterm and final exams.
3. **A notebook** is *required* for the collection of new words and key terms occurring in your textbook. Strongly recommend to have your notebook with you to work in the classroom.

**Obtaining Current Course Information:**

The most current information for *Chemistry VC210* can be obtained at the **Mastering Chemistry** (MC) website: <http://www.masteringchemistry.com/>, or from the class web site, CANVAS: <https://sjtu-umich.instructure.com> For canvas, you may need your login unique name, your student ID, Chinese name & PIN YIN, and password to login and access this course management site. You will find there a copy of this syllabus, announcements, homework assignments, course resources, and supplemental information pertaining to class. For MC you need the course ID to access the homework assignments and information from your instructor. The course ID is **VC210HAMADE2016NEW**. Please check these 2 sites frequently.

**Grading Policy: (Maximum Total Grade 100%)**

Grade is determined based on your performance on midterm exam, the final exam, PPT presentation & report (posted on CANVAS & MC), homework assignments, class attendance, and participation with acceptable recitation & discussion performance. Maximum weighted points & % grade as follows:

<b>Midterm Exam</b>	<b>350PTS</b>	<b>35%</b>
<b>Homework Assignments</b>	<b>200PTS</b>	<b>20%</b>
<b>Presentation, group report, attendance &amp; class participation</b>	<b>100PTS</b>	<b>10%</b>
<b>Final Exam</b>	<b>350PTS</b>	<b>35%</b>
<b>Total Maximum</b>	<b>1000PTS</b>	<b>100%</b>

**Midterm Exam (maximum 35% of Grade):** A closed-book 90-minute midterm examination is scheduled (Exam time and rooms are assigned later).

**Final Exam (maximum 35% of Grade):** A closed-book 96-minute final examination is required.

**Homework Assignments (maximum 20% of Grade) = Online “MC” Assignments grade + Additional Problems to “MC” grade (see a & b next)**

- a. **Online “MC” Assignments:** 17 Homework Sets will be posted regularly at the **Mastering Chemistry** (MC) website (course ID: **VC210HAMADE2016NEW**): <http://www.masteringchemistry.com> and on CANVAS <https://sjtu-umich.instructure.com>. You may need to use your unique name and password to login and access this course management site. Homework sets usually have a due time posted on “MC” & CANVAS. The online **“MC” Assignments** selected from the end-of-chapter problems of the textbook is graded immediately by the computer system and **it is not necessary to submit the results to your instructor or TA.** **“MC” Assignments** grade (maximum 10%): *each assignment worth its own score posted on MC website, then your final grade for these assignments = (your total scores of these assignments/total possible scores) x 10%*
- b. **Additional Problems to “MC”:** from the end-of-chapter will also be posted on **CANVAS** and they are due as instructed on **CANVAS** and on last page of this Syllabus. The **Additional Problems to “MC”** must be submitted to instructor on schedule at end of his lecture. **Additional Problems to “MC”** grade (maximum 10%): Each chapter assignment will be graded relative to student efforts from 0 to 6.25 points, -0- score means no efforts and 6.25 score means at least 85% of the problems are complete and accurate. *Your final grade for these assignments = (the sum of scores from each individual assignment / total possible scores) x 10%.*

**PPT Presentation, Report, Attendance & Class Participation (maximum 10% of Grade):**

It is essential for students to learn communication skills in addition to attendance & class participation. The presentation & report sections are arranged in the middle of the course. To understand how to put the science into action, a few of topics about modern materials and advanced chemistry topics will be discussed in class. The students will be divided into groups of 4-6 students (near the middle of semester). **Each group selects or get assigned one of these topics and must give PPT presentation on selected topic to your TA & classmates, during the**

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**recitation session, after the midterm exam. Each group will be required to give short 15 minutes oral presentation during the assigned schedule as announced on CANVAS. In addition, each group is required to write a short report about the topic that will be due as noted on this syllabus schedule.** Each student in a group will receive the same grade for the PPT & report as the other members of the same group, so you must work together as a team and begin learning how to organize and manage projects amicably. For any negative issues with team members, bring that to the attention of your TA and then to the instructor. Refer to CANVAS & MC for uploaded documents of instructions and updates from instructor and TA's. Additional grading criteria and important PPT/Report guidelines are also posted on CANVAS. PPT & REPORT assignments are worth a maximum of 10% of the overall class grade (including attendance & class participation). The following will be highly expected to be emphasized and practiced during the team work procedure:

- To encourage an appreciation of the scientific, social, economic, environmental and techn. aspects of chemistry,
- To illustrate generally how humanity has benefited from the study and practice of chemistry.
- To develop skills of analysis, problem-solving, communication, evaluation and hands-on capacities (including introduction to technical report writing and scientific publications).

**Honor Code Policy & Plagiarism:**

Homework must be completed independently, however students are encouraged to discuss topics but not copy any of the problems from each other. No student is allowed to help, share, or do solve any class assignment (including MC) for others and **“any violation of the Honor Code in the course of completion of the work leads to an automatic loss of all points for this work”**. Exams, tests and quizzes must be worked independently and they are closed books & closed notes (not allowed: dictionaries, digital devices, computers, course materials, notes and textbooks, allowed: standard non-programmable calculator). Follow the PPT and writing report guidelines posted on CANVAS, you are permitted to share PPT and report information within your group only but you are not allowed to have other groups copy your PPT or your report. You must cite your sources as a reference all your graphs, pictures, figures, tables, theories, equations, etc. You are not allowed to make copies of any course materials without the written permission of the original publisher. You must follow JI policy on honor code and review consequences for violation of such policy. Refer to your student handbook for further honor code policies.

**In case of illness or other emergency:**

Sometimes (rarely) students have to miss exams because of illness or other types of emergency. If you are ill and have to miss an exam, please e-mail your TA and lecturer immediately and ask your doctor for a note in confirmation. And someone who miss the midterm for his/her illness or other emergency will make up the midterm again, usually the make-up exam will be harder than the previous one. **Absolutely, taking a driving test, having a meeting with the President, or meeting King Abdul-Hamid, and so & Soh, etc., are not valid emergency types. Also, such entities you can ask them to make other appointments not in conflict with your class or exam schedule (unless you are given a verifiable written government order to do so).**

**Teaching Assistance Schedule (subject to change): Office hours location at JI in the Electronic Library of Law School building. Check CANVAS announcements & complete this schedule during first week.**

TA Name Pinyin	TA name Chinese	Student ID	Phone	TA's email	Recitation Sched.	Office Hour
1 HE Kaijun	何凯君	515370910211	15821925773	hekaijun123@126.com	Tue. 18:20~20:00 F202	Thu. 18:00~20:00
2 LU Xiuneng	鲁修能	5140109100	15800793216	luxiuneng@sjtu.edu.cn	Wed. 18:20~20:00 F203	Wed. 20:00~22:00
3 SONG Huanian	宋华年	515370910051	15821805379	songhuanian@sjtu.edu.cn	Wed. 12:10~13:50 F203	Wed. 20:00~22:00
4 WU Haoxiang	邬浩翔	515370910228	13022151766	whx1022@gmail.com	Tue. 18:20~20:00 F402	Tue. 20:00~22:00
5 ZHANG Shengnan	张胜男	5143709004	13564522021	zsn19951211@sjtu.edu.cn	Mon. 18:20~20:00 F205	Tue. 16:00~18:00
6 LOU Yuze	楼宇泽	515370910101	15821821065	lyzlyz@sjtu.edu.cn	Wed. 18:20~20:00 F202	Wed. 20:00~22:00
7 Mhmd N. ul Haq	-	0140729048	15221835795	Haq.noaman@sjtu.edu.cn	Fri. 18:20~19:50 F203	Fri. 9:00~11:00

TA-s EMAIL: [hekaijun123@126.com](mailto:hekaijun123@126.com), [luxiuneng@sjtu.edu.cn](mailto:luxiuneng@sjtu.edu.cn), [songhuanian@sjtu.edu.cn](mailto:songhuanian@sjtu.edu.cn), [whx1022@gmail.com](mailto:whx1022@gmail.com), [zsn19951211@sjtu.edu.cn](mailto:zsn19951211@sjtu.edu.cn), [lyzlyz@sjtu.edu.cn](mailto:lyzlyz@sjtu.edu.cn), [Haq.noaman@sjtu.edu.cn](mailto:Haq.noaman@sjtu.edu.cn)

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**VC210 CHEMISTRY HOMEWORK ASSIGNMENTS: MASTERING CHEMISTRY “MC”**

**Homework assignments, must do both Part a & Part b:** No late assignments will be accepted after due dates

**Part a:** 17 Homework Sets will be posted regularly at the **Mastering Chemistry** (MC) website (course ID **VC210HAMADE2016NEW**). Register at: <http://www.masteringchemistry.com> then Login at: <http://portal.mypearson.com/mypearson-login.jsp>)

**Part b:** Must do the Additional Problems to “MC” listed in Table below and also posted on CANVAS under Files/HOMEWORK ASSIGNMENTS (Access CANVAS: <https://sju-umich.instructure.com>)

CH#	“MC” ASSIGNMENTS (17 Assignments) SEE “MC” WEBSITE FOR DUE DATES	ADDITIONAL PROBLEMS TO “MC”▶	DUE DATES
CH1	MC WEBSITE: 1 <sup>ST</sup> PRACTICE ASSIGNMENT “Introduction to Mastering Chemistry” & “CH1 HW”  * new 13ed book while others from 12ed book converted to 13ed book.	a. CH1: 27,37,42,61,75. b. Solve: (1) If T=32 <sup>OF</sup> then 4T=? (2) T= - 220 <sup>OC</sup> then 3T=? c. Statistics & data analysis questions: Posted on CANVAS under “Files/HOMEWORK ASSIGNMENTS/ 1HW CH1&CH2 ADDTL TO MC.pdf	Mon SEP 26
CH2	“CH2 HW”	CH2: 26,81, 89a, 96a*	Mon Sep 26
CH3	“CH3 HW”	CH3: 32, 44, 59*,94	Fri Oct 14
CH6	“CH6 HW”	CH6: 39*, 48, 76*a,c,e, 86	Fri Oct 14
CH4	“CH4 HW”	CH4: 21, 37, 67*, 85	Mon Oct 24
CH5	“CH5 HW”	CH5: 25*, 63*, 89*, 110	Mon Oct 24
CH8	“CH8 HW”	CH8: 28, 34*, 63, 89	Mon Oct 28
CH9	“CH9 HW”	CH9: 20, 29, 50, 62	Mon Oct 28
	<b>MIDTERM TEST CH1, CH2, CH3, CH4,CH5, CH6, CH8, CH9 + Statistics &amp; Data Analysis (see CANVAS)</b>		<b>Wed NOV 2</b>
CH11	“CH11 HW”	CH11: 46,62,84	Mon Nov 14
CH13	“CH13 HW”	CH13: 37*,56,81,96	Mon Nov 14
CH14	“CH14 HW”	CH14: 7*,29,53	<b>Wed Nov 23</b>
CH15	“CH15 HW”	CH15: 45,53*,56*	<b>Wed Nov 23</b>
CH16	“CH16 HW”	CH16: 15*,27,48*	Wed Nov 30
CH17	“CH17 HW”	CH17: 28,58,67	Wed Nov 30
CH19	“CH19 HW”	CH19: 26,58*,70,76	Fri Dec 9
CH20	“CH20 HW”	CH20: 35*, 38*a,c, 54*, 87	Fri Dec 9
	<b>DUE Group PPT (during recitation sessions) – Group Final Report on PPT topic ( due at start of lecture)</b>		<b>Fri Dec 9</b>
	<b>FINAL EXAM: CH10, CH11, CH13, CH14, CH15, CH16, CH17, CH19, CH20 (Verify exam schedule on CANVAS)</b>		<b>Mon Dec 14</b>

Check the above websites very often to confirm assignments. Students must do all the online posted “MC” assignments at “MC” website before due dates posted on the website (use “MC” course ID: **VC210HAMADE2016NEW**). The additional problems to “MC” must be turned in to your instructor at end of lecture on due dates below. This is a tentative assignment & subject to change by instructor.

**Homework Assignments grade (maximum 20% of Grade)** = Part a: “MC” Assignments grade + Part b: Additional Problems to “MC” grade:

▶ **Part a: “MC” Assignments (Maximum worth 100 points or 10% of course grade):** each assignment worth its own score posted on “MC” website, then your final grade for these assignments = (your total scores of these assignments/total possible scores) x10%

▶ **Part b: Additional Problems to “MC” (Maximum worth 100 points or 10% of course grade):** Each chapter assignment will be graded relative to student efforts from 0 to 6.25 points, -0- score means no efforts and 6.25 score means at least 85% of the problems are complete and accurate. Your final grade for these assignments = (the sum of scores from each individual assignment / total possible scores) x10%

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**COURSE SCHEDULE: SEP. 14 – DEC 18, 2015 (Tentative – Subject to change)**  
**Additional Problems to “MC” homework must be submitted to instructor on due dates at start of lecture. Check MC website for MC homework assignments due dates & extension of due dates**

wk	Day	Date	Topic	HW Due*
1	Mon	Sep 12	<b>UNDERGRADUATE OFFICE ORIENTATION</b>	
1	Wed	14	Course orientation, introduction to chemistry	
1	Fri	16	<b>HOLIDAY NO CLASS</b>	
1	Sun	18	CH1 Introduction: Matter & Measurement Statistics & Numbers (see CANVAS resources)	
2	Mon	19	CH2 Atoms, Molecules & Ions	
2	Wed	21	CH3 Stoichiometry: Calc. Chem. Formulas & Eqn	
3	Mon	26	CH 3 Continued	<b>CH1&amp;CH2</b>
3	Wed	28	CH6 Electronic Structures of Atoms	
3	Fri	30	CH6 Continue	
4	Mon	<b>Oct 3</b>	<b>HOLIDAY NO CLASSES</b>	
4	Wed	<b>5</b>	<b>HOLIDAY NO CLASS</b>	
5	Mon	10	CH4 Reactions in Aqueous Solutions	
5	Wed	12	CH5 Thermochemistry	
5	Fri	14	CH5 Continued	<b>CH3&amp;CH6</b>
6	Mon	17	CH8 Basic Concepts of Chemical Bonding	
6	Wed	19	CH8 Continued	
7	Mon	24	CH9 Molecular Geometry & Bonding Theories	<b>CH4&amp;CH5</b>
7	Wed	26	CH9 Continued	
7	Fri	28	CH10 Gases	<b>CH8&amp;CH9</b>
8	Mon	<b>31</b>	MIDTERM EXAM review	
<b>8</b>	<b>Wed</b>	<b>Nov. 2</b>	<b>MIDTERM EXAM CH1-CH9, SKIP CH7 (tentative schedule, check CANVAS announcements)</b>	
9	Mon	7	CH11 Liquids & Intermol. Forces [Group PPT-s start during recitation]	
9	Wed	9	CH13 Properties of Solutions [Group PPT-s continues during recitation]	
9	Fri	11	CH14 Chemical Kinetics Continue [Group PPT-s continues during recitation]	
10	Mon	14	CH14 Continued [Group PPT-s continues during recitation]	<b>CH11&amp;CH13</b>
10	Wed	16	CH15 Chemical Equilibrium, skip section 7 [Group PPT-s continues during recitation]	
<b>10</b>	<b>Fri</b>	<b>18</b>	<b>CH16 Acid Base Equilibria, skip sections 10-11 [Group PPT-s continues during recitation]</b>	
<b>11</b>	<b>Mon</b>	<b>21</b>	<b>NO CLASS (REPLACED BY FRIDAY NOVEMBER 18 ABOVE)</b>	
11	Wed	23	CH17 Additional Aspects of Aq. Equil., skip section 7 [Group PPT-s continues during recitation]	<b>CH14&amp;CH15</b>
<b>11</b>	<b>Fri</b>	<b>25</b>	<b>NO CLASS (REPLACED BY FRIDAY December 2 BELOW)</b>	
12	Mon	28	CH17 Continued	
12	Wed	30	CH19 Chemical Thermodynamics[Group PPT-s continues]	<b>CH16&amp;CH17</b>
<b>12</b>	<b>Fri</b>	<b>2</b>	<b>CH19 Continued[Group PPT-s during recitation] S1:8:00AM &amp;S2:4:00PM</b>	
13	Mon	Dec. 5	CH20 Electrochemistry[Group PPT-s continues during recitation]	
13	Wed	7	CH20 Continued, Final Exam Review [Top three Group PPT-s announced to present during lecture]	
13	Fri	9	<b>3 BEST PPT's/Class: CH12 Solids &amp; Modern Materials FINAL REPORT on PPT's due at start of lecture</b>	<b>CH19&amp;CH20</b>
<b>14</b>	<b>Wed.</b>	<b>14</b>	<b>FINAL EXAM: CH10, CH11, CH13 to CH17, CH19 &amp; CH20 (tentative schedule, check CANVAS announcements). Exam duration time: 8:00AM-9:30AM</b>	