

ATENEDE DE MANILA UNIVERSITY
 Loyola Schools
 Generic Course Syllabus for 2nd Semester, School Year 2012-2013

Department	Chemistry	School	Science and Engineering
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Course No.	CH 1
Course Title	General Chemistry, Lecture
No. of Units	3

Course Description:

The general aim of the course is to provide the students a firm background and understanding of the role of the natural sciences in their everyday lives in the context of chemistry as a central science. The course is designed to make general chemistry interesting in order to elicit positive attitudes of students towards chemistry, and science in Philippine life in general.

Course Objective/s:

At the end of the course, the student will be able to:

1. Define the scientific method
2. Identify the general properties of matter and some physical and chemical transformations
3. Draw, name, and classify simple molecules according to chemical class and reactivity
4. Apply clear and logical analytical thinking skills by
 - a. explaining everyday phenomena on the molecular level
 - b. performing chemical calculations
5. Report on the chemical bases and effects of industries significant to the Philippine setting
6. Relate chemistry to own community or chosen career

Course Outline:

WEEK	TOPIC	REFERENCES
1	CLASS ORIENTATION: Welcome to the exciting world of chemistry!	Brown LeMay Bursten: 1-4, 2-28 Chang: 6-8 Hill Kolb: 1-12, 17-27, Appendix A
	THE HEART OF THE MATTER: Matter, its properties and changes <ul style="list-style-type: none"> • Classifications of matter • Properties and states of matter 	Brown LeMay Bursten: 5-12 Chang: 8-25 Hill Kolb: 12-18
2		

	<ul style="list-style-type: none"> Scientific measurement 	
3	<p>ATOMS IN ACTION: Atomic theories, models, and electronic structures</p> <ul style="list-style-type: none"> Atomic theory of matter Development of atomic models Quantum mechanical model Electron configuration 	<p>Brown LeMay Bursten: 35-44, Chapter VI Chang: 36-45, Chapter VII Hill Kolb: Chapters II-III</p>
4	<p>ATOMIC FASHION, PERIODIC TRENDS: Unlocking the periodic table</p> <ul style="list-style-type: none"> The periodic table of elements Electron configuration and periodicity Periodic trends 	<p>Brown LeMay Bursten: 44- 49 Chang: Chapter VIII Hill Kolb: Chapter III (76-79)</p>
Long Test 1		
5	<p>MY NAME IS BOND ... CHEMICAL BOND PART 1: Chemical bonding</p> <ul style="list-style-type: none"> Ionic bond Covalent bond 	<p>Brown LeMay Bursten: Chapter VIII Chang: 329-332, 338-343 Hill Kolb: Chapter V</p>
6	<p>GIVE ME A NAME: The language of chemistry, symbols, formulas, and nomenclature</p> <ul style="list-style-type: none"> Names and symbols for simple ions Formulas and names for ionic compounds Formulas and names for covalent compounds 	<p>Brown LeMay Bursten: 47-60 Chang: 53-61 Hill Kolb: Chapter VI</p>
7	<p>MY NAME IS BOND ... CHEMICAL BOND PART 2: Molecular interaction</p> <ul style="list-style-type: none"> Lewis structure Molecular structure Intermolecular forces 	<p>Brown LeMay Bursten: Chapters VIII-IX Chang: 343-354, 368-384 Hill Kolb: Chapter V</p>
8		
Long Test 2		
9	<p>CHEMICAL REACTIONS: ELECTRONIC TAKE-OVERS AND MERGERS:</p>	

10	The arithmetic of chemistry, equations and stoichiometry <ul style="list-style-type: none"> • The mole concept • Avogadro's number • Molar mass • Chemical reactions and chemical equations • Stoichiometry 	Brown LeMay Bursten: Chapter III Chang: Chapter III Hill Kolb: Chapter VI
11	CHEMISTS HAVE SOLUTIONS: Reactions in solutions <ul style="list-style-type: none"> • Acids and bases • The pH scale • REDOX reactions 	Brown LeMay Bursten: Chapter IV Chang: 105-108, 111-128 Hill Kolb: Chapter VII-VIII
12		
Long Test 3		
13-15	SPECIAL TOPICS	
16-17	Group Presentations and Wrap-up Session	
18	Final Exam Week	

References (optional):

1. Brown, T.L., H.E. LeMay, and B.E. Bursten. 2002. Chemistry: The Central Science 8th ed. Singapore: Pearson Education Asia Pte. Ltd.*^Δ
2. Chang, R. 2002. Chemistry 7th ed. USA: Prentice Hall.*^Δ
3. Hill, J.W. and D.K. Kolb. 1995. Chemistry for Changing Times 7th ed. Prentice Hall.*
4. Snyder, C.H. The Extraordinary Chemistry of Ordinary Things 2nd/3rd ed. New York: John Wiley & Sons, Inc.
5. Any general chemistry textbook; other readings to be distributed in class

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Department	Chemistry	School	Science and Engineering
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Course No.	CH 2
Course Title	General Chemistry, Laboratory
No. of Units	1

Course Description:

This is an accompanying laboratory course to Ch1. The general aim of the course is to deeply appreciate the experimental nature of chemistry. Specifically, the students should develop skills in the scientific method: making qualitative and quantitative observations, technical presentation of data, analytical and critical interpretation of results (which includes discussing these results in the light of the modern theories of chemistry). The students are expected to learn fundamental skills in the chemical laboratory such as handling of chemicals, the burner, glassware, and the balance.

Course Objective/s:

At the end of the course, the student will be able to:

- Practice the scientific method: collecting qualitative and quantitative data, processing and reporting these data, and making critical analysis and interpretation of the results in the light of the chemical theories
- Demonstrate basic laboratory skills such as handling of chemicals and using instruments such as the burner, the balance and various glassware
- Explain common phenomena and processes in the molecular point of view
- Relate the processes used in the experiments to the processes in the local industries.

Course Outline:

Date	Laboratory Activity*
Nov 08	Orientation and Check In
15	Expt#01: Measurements; Expt#02: Conservation of Mass
22	Expt#03: Layering Liquids
29	Expt#05: Flame Test; Expt#06: Ca and K Content of Common Substances
Dec 06	Expt#15: Anti-chap Lipstick or Expt#07: Hand Cream
13	Expt#04: Ink/Candy Chromatography
20	Lab Discussion & Reporting
Jan 10	Expt#19: Reactions- Ions in Motion
17	Expt#10: pH of Common Substances and Compounds
24	Expt#9: Blueprinting
31	Expt#13: Copper into Gold
Feb 07	Expt#16: Hidden Sugars or Expt#18: Synthesis of Organic Compounds

14	Expt#12: Ice Cream or Expt#14: Tie Dye
21	Lab Discussion & Reporting
28	Lab Discussion & Reporting
March 07	Lab Exam
14	Checkout

References (optional):

Laboratory Manual

CH2 Laboratory Manual and Worksheets, 2008 ed. (Based on Javellana, A. M. Simple Chemistry Experiments, 5th ed/4th ed. Ateneo de Manila Univ, c.1994.)

* *Students must purchase the laboratory manual and workbook from the LS Bookstore. Photocopied worksheets will not be allowed.* *

Suggested Additional References

Brown, T.L., LeMay, H.E., and B.E. Bursten. Chemistry : The Central Science
6th/7th/8th/9thed.

Prentice-Hall International Inc. (Indicated pages are for 8th ed.)

Chang, Raymond. *Chemistry 7th/8th/9th ed.* USA: McGraw-Hill, 2005.

Hill, J. W. and D. K. Kolb. Chemistry for Changing Times, 7th/8th/9th/10th ed. Prentice-Hall, c.1995.

Snyder, C.H. The Extraordinary Chemistry of Ordinary Things. 2nd/3rd ed. New York: John Wiley & Sons, Inc.