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| Course Title/Number | <b>Principles of Chemistry I / CHM 211, Section 103</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Semester/Year       | Fall 2017                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Days/Time/Location  | MWF 11:00-11:50 AM, Science Hall 473                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Instructor          | Derrick R. J. Kolling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Office              | 2217 AWFAEC; Research lab: 2208 AWFAEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Phone               | (304) 696-2307                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| E-Mail              | <a href="mailto:kolling@marshall.edu">kolling@marshall.edu</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Office Hours        | Tuesday 1:30–3:30 P.M. (L.A. Session room), Wednesday 1–4 P.M (office). If you cannot attend the scheduled times, email or call me to set up an appointment. Expect to wait at least 24 hours before responses to emails.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| University Policies | By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to <a href="http://www.marshall.edu/academic-affairs">www.marshall.edu/academic-affairs</a> and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to <a href="http://www.marshall.edu/academic-affairs/policies/">www.marshall.edu/academic-affairs/policies/</a> .<br>Academic Dishonesty/Excused Absence Policy for Undergraduates/Computing Services Acceptable Use/Inclement Weather/Dead Week/Students with Disabilities/Academic Forgiveness/Academic Probation and Suspension/Academic Rights and Responsibilities of Students/Affirmative Action/Sexual Harassment |

### Course Description

A study of the properties of materials and their interactions with each other. Development of theories and applications of the principles of energetics, dynamics and structure. Intended primarily for science majors and pre-professional students. 3 credit hours. (PR or CR: CHM 217; PR: Math ACT of 23 or better, or C or better in CHM 111, or pass placement exam)

### Required Texts, Additional Reading, and Other Materials

1. ***Principles of General Chemistry, Third Edition*** by Martin S. Silberberg, McGraw-Hill, 2013.
2. ALEKS access
3. MUOnline BlackBoard access
4. Turning Point Personal Response Device (must be registered on MUOnline)
5. Non-programmable scientific calculator for tests and exams (must not have text storage or alphanumeric data input capabilities—in general, this means no function keys or keypads with the complete alphabet)
6. #2 pencil and black or blue ink pen for tests

| Course student learning outcomes                                                                                | How students will practice each outcome in this course                                                                     | How student achievement of each outcome will be assessed in this course                  |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Students will classify matter and chemical reactions.                                                           | <ul style="list-style-type: none"> <li>• in-class exercises</li> <li>• ALEKS exercises</li> <li>• L.A. sessions</li> </ul> | <ul style="list-style-type: none"> <li>• exams</li> <li>• 'clicker' questions</li> </ul> |
| Students will apply principles of atomic structure and bonding theories to describe how matter is composed.     | <ul style="list-style-type: none"> <li>• in-class exercises</li> <li>• ALEKS exercises</li> <li>• L.A. sessions</li> </ul> | <ul style="list-style-type: none"> <li>• exams</li> <li>• 'clicker' questions</li> </ul> |
| Students will apply mathematical techniques to describe reactions, physical properties, and energies of matter. | <ul style="list-style-type: none"> <li>• in-class exercises</li> <li>• ALEKS exercises</li> <li>• L.A. sessions</li> </ul> | <ul style="list-style-type: none"> <li>• exams</li> <li>• 'clicker' questions</li> </ul> |
| Students will identify and explain trends in physical and chemical properties.                                  | <ul style="list-style-type: none"> <li>• in-class exercises</li> <li>• ALEKS exercises</li> <li>• L.A. sessions</li> </ul> | <ul style="list-style-type: none"> <li>• exams</li> <li>• 'clicker' questions</li> </ul> |

### Grading Policy

|                               |             |                                  |
|-------------------------------|-------------|----------------------------------|
| ALEKS (Online homework) %     | 150         | points                           |
| tests (4 during the semester) | 600         | points                           |
| final exam                    | 250         | points                           |
|                               | <b>1000</b> | <b>TOTAL POINTS<sup>#*</sup></b> |

**%ALEKS:** There are two components to the ALEKS score, each worth 75 points.

1) Objective completion—points are earned by completing objectives by the due date.

2) Topic (pie chart) mastery—at the end of the semester, the percentage of topics mastered will be multiplied by 75 points to arrive at the Topic score.

**#Clicker Problems:** Clicker problems are worth up to 20 points extra credit.

**\*Learning Assistance Sessions:** L.A. Sessions are worth up to 20 points extra credit.

**Grading Scale:**

|                 |   |
|-----------------|---|
| 900-1000 points | A |
| 800-899 points  | B |
| 700-799 points  | C |
| 600-699 points  | D |
| 000-599 points  | F |

**Attendance Policy**

Attendance is mandatory for tests and exams. Make-up tests and exams will be granted only in cases that are recognized by the University through an excused absence (via the Dean of Student Affairs). Students should contact the instructor as soon as they are able to return to classes. If class is cancelled unexpectedly, scheduled tests will be given during the next class meeting. Attendance is highly suggested for lectures; 'clicker' questions that are worth extra credit will be given.

**Tentative Course Schedule**

| Week of:                                         | Chapter                                                  | Topic                                      |
|--------------------------------------------------|----------------------------------------------------------|--------------------------------------------|
| 8/21                                             | 1                                                        | Definitions, Problem Solving, Measurements |
| 8/28                                             | 2,3                                                      | Components of Matter, Stoichiometry        |
| 9/4                                              | No class on 9/4; 3                                       | Stoichiometry                              |
| 9/11                                             | TEST 1 on 9/11; 3,4                                      | Stoichiometry, Chemical Reactions          |
| 9/18                                             | 4                                                        | Chemical Reactions                         |
| 9/25                                             | 5                                                        | Ideal Gases                                |
| 10/2                                             | TEST 2 on 10/2; 5,6                                      | Ideal Gases, Thermochemistry               |
| 10/9                                             | 6                                                        | Thermochemistry                            |
| 10/16                                            | 7                                                        | Quantum Theory                             |
| 10/23                                            | TEST 3 on 10/23; 7, 8                                    | Quantum Theory, Electron Configuration     |
|                                                  | 10/27 is last day to withdraw from full-semester courses |                                            |
| 10/30                                            | 8,9                                                      | Chemical Periodicity, Chemical Bonding     |
| 11/6                                             | 9,10                                                     | Chemical Bonding, Shapes of Molecules      |
| 11/13                                            | TEST 4 on 11/13; 10,11                                   | Shapes of Molecules, Covalent Bonding      |
| 11/20                                            | No class (Fall Break)                                    |                                            |
| 11/27                                            | 11                                                       | Covalent Bonding                           |
| 12/4                                             | Snow day make-ups; review                                |                                            |
| 12/9 SATURDAY 10:00 AM FINAL EXAM (location TBA) |                                                          |                                            |