Code # SM12 (2015

**Bulletin Change Transmittal Form**

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| **Bulletin Change**Please attach a copy of all catalogue pages requiring editorial changes. |

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| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Department Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**COPE Chair (if applicable)** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Department Chair:**  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**General Education Committee Chair (If applicable)**   |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**College Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Undergraduate Curriculum Council Chair** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**College Dean** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Graduate Curriculum Committee Chair** |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Vice Chancellor for Academic Affairs** |

**1.Contact Person** (Name, Email Address, Phone Number)

William Burns, wburns@astate.edu (870)-972-2535

**2.Proposed Change**

Change bulletin course description of CHEM 1023, CHEM 2004, CHEM 3054, CHEM 3103, and CHEM 3113 to include a course grade of C or better in associated prerequisite course.

**3.Effective Date**

Spring 2016

**4.Justification**

A common belief among students at many universities is that chemistry is a demanding subject, requiring a great deal of effort.

The percent DF and DFW grades assigned in selected A-State chemistry courses during the period spring 2013-spring 2015 (excluding summer terms) is provided in Table 1 do support this belief.

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| **Table 1** |
| **Course** | **Percent D and F** | **Percent D, F and W** |
| Chem 1013 (General Chemistry I) | 31.3 | 46.5 |
| Chem 1023 (General Chemistry II) | 24.2 | 37.2 |
| Chem 2004 (Descriptive Inorganic Chemistry)  | 12.7 | 23.8 |
| Chem 3054 (Quantitative Analysis) | 15.7 | 27.2 |
| Chem 3103 (Organic Chemistry I) | 18.3 | 45.1 |
| Chem 3113 (Organic Chemistry II) | 16.2 | 33.7 |

An obvious goal of course modification is to increase student success, and realization of this goal requires both faculty and student participation. Faculty will likely need to complete several cycles of assessment to identify course changes that will result in improved course performance. Students will need to understand mastery and retention of prerequisite course content is essential to adequate performance. In support of this student participation, faculty are obligated to identify any students that do not exhibit mastery of prerequisite content.

It is proposed prerequisites for Chem 1023, 2004, 3054, 3103, and 3113 be altered to include a grade of C or better in the existing prerequisite courses provided in Table 2. This change will prohibit students receiving a D (or F) in the prerequisite course from enrolling in the subsequent course. The potential impact of this proposed change can be estimated by considering students enrolled in Chem 1023, 3054, 3103, or 3113 during spring 2015, that 1) were assigned a A-F letter grade, and 2) completed the associated prerequisite during the period spring 2013-fall 2014 (Table 2). The analysis indicates the proposed change would significantly reduce the number of students earning a D or F in a course, and have correspondingly little impact on students earning an A, B, or C.

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| **Table 2** |
| **Course (prerequisite)**  | **Percent of students earning D/F in course and earned D/F in prerequisite course** | **Percent of students earning A/B/C in course and earned D/F in prerequisite course** |
| Chem 1023 (Chem 1013) | 19.0 | 5.7 |
| Chem 2004 (Chem 1023) \* | 16.6 | 0.0 |
| Chem 3054 (Chem 1023) | 25.0 | 0.0 |
| Chem 3103 (Chem 1023) | 40.0 | 4.6 |
| Chem 3113 (Chem 3103) | 28.6 | 0.0 |
|  \* Chem 2004 is only taught in the fall term. Data corresponds to students enrolled in Chem 2004 during fall 2014, that 1) were assigned a A-F letter grade, and 2) completed the associated prerequisite during the period fall 2012-spring 2014. |

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**Method and Material Teaching Science (EDSC)**

**EDSC 4593. Methods and Materials Teaching Science in the Secondary School** Philosophical bases, teaching techniques, curriculum development, classroom management, facility resources, and equipment are emphasized. Must be admitted to the Teacher Education Program. Fall, Spring.

**Teaching Internship (TIBI)**

**TIBI 4825. Biology Teaching Internship in the Secondary School** Ten semester hours. Full semester teaching internship. Fall, Spring.

**TIBI 4826. Biology Teaching Internship in the Secondary School** Twelve semester hours. Full semester of teaching internship. Fall, Spring..

**DEPARTMENT OF CHEMISTRY AND PHYSICS**

**Chemistry (CHEM)**

**CHEM 1003. Introduction to Chemistry** Fundamentals of chemical terms and applications to laboratory studies. Extensive drills on calculations and use of hand held calculator in problem solving. Recommended for those with no prior study of chemistry. Special course fees may apply. Corequisite or prerequisite, MATH 0003, MATH 0013, or MATH 1023. Fall, Spring.

**CHEM 1011. General Chemistry I Laboratory** Introduction and development of hands-on tech­niques essential to the use of fundamental equipment and glassware common in all laboratory based sub-fields of chemistry. Computer-based graphical and statistical analysis of data. Three hours per week. Special course fees may apply. Prerequisite or corequisite, CHEM 1013. Fall, Spring, Summer. (ACTS#: CHEM 1414)

**CHEM 1013. General Chemistry I** Study of chemical reactions and equations, periodic rela­tionships, the gaseous state, and the fundamentals of atomic theory, quantum theory, electronic structure, chemical bonding, stoichiometry and thermochemistry. Special course fees may apply. Prerequisite, MATH 1023 or ACT composite score of 23 or higher. Prior completion of CHEM 1003 or high school chemistry strongly recommended. Fall, Spring, Summer. (ACTS#: CHEM 1414)

**CHEM 1021. General Chemistry II Laboratory** Continuation of CHEM 1011, with focus on dem­onstrating mastery of selected hands-on laboratory techniques and computer-assisted graphical and statistical analysis of data. Three hours per week. Corequisite or prerequisite, CHEM 1023. Prerequisite, CHEM 1011. Fall, Spring, Summer. (ACTS#: CHEM 1424)

**CHEM 1023. General Chemistry II** Study of liquids, solids, solutions and the fundamentals of chemical kinetics, chemical equilibria, acids and bases, thermodynamics, and electrochemistry. Special course fees may apply. Prerequisites, CHEM 1011 and CHEM 1013, **Grade of C or better in CHEM 1013**. Fall, Spring, Sum­mer. (ACTS#: CHEM 1424)

**CHEM 1031. Introduction to Organic and Biochemistry Laboratory** Three hours per week. Not open to chemistry majors. Special course fees may apply. Prerequisites, CHEM 1011 and CHEM 1013. Corequisite, CHEM 1033. Demand.

**CHEM 1033. Introduction to Organic and Biochemistry** Emphasis on applications to body functions. Lecture three hours, laboratory three hours. Not open to chemistry majors. Special course fees may apply. Prerequisite, CHEM 1011 and CHEM 1013. Demand.

**CHEM 1041. Fundamental Concepts of Chemistry Laboratory** Special course fees apply. Prerequisite or corequisite of CHEM 1043. Fall, Summer.

**CHEM 1043. Fundamental Concepts of Chemistry** A one semester chemistry survey course introducing selected fundamental concepts including dimensional analysis, mole concept, atomic and molecular structure, nomenclature, chemical reactions, thermochemistry, intermolecular inter­actions, gases, mixtures, kinetics, equilibrium and acid base chemistry. Fall, Summer.

**CHEM 1052. Fundamental Concepts of Organic and Biochemistry** A continuation of CHEM 1043 with a focus on the role of chemistry in human body functions. Prerequisites CHEM 1043 and CHEM 1041. Spring, Summer.

**CHEM 2002. Computers in Chemistry** Introduction to computer software and common practices used in the analysis and presentation of scientific data. Corequisite or prerequisite, CHEM 1023 and CHEM 1021. Spring.

**CHEM 2004. Descriptive Inorganic Chemistry** Systematic study of the chemistry of the elements with problem solving using microcomputers. Lecture four hours per week. Special course fees may apply. Prerequisite, CHEM 1021 and 1023, **Grade of C or better in CHEM 1023**. Fall.

**CHEM 2393. Special Problems** Selected special or current topics of interest to faculty and students that require no prerequisite courses. This course is appropriate for a general student audience. See individual semester schedules for more information about each offering. Demand.

**CHEM 3051. Try Out the Classroom** Introductory classroom experience led by ASU STEM faculty and area teachers. Topics include Arkansas science/math curriculum, classroom manage­ment, laboratory safety, and basic teaching skills. Students will develop and present science/math activities in area classrooms and campus outreach. Prerequisites, 8 CHEM credit hours. Fall.

**CHEM 3054. Quantitative Analysis** Emphasizes quantitative and critical analysis based on stan­dard analytical techniques and instrumentation. Topics include statistics, material equilibria, basic skills in instrumentation and electroanalytical methods. Lecture two hours, laboratory six hours per week. Special course fees may apply. Prerequisites, MATH 2204 or 2194, CHEM 1021 and 1023, **Grade of C or better in CHEM 1023** **~~or permission of Instructor~~**. Spring.

**CHEM 3101. Organic Chemistry I Laboratory** Laboratory skills illustrating the principles of Organic Chemistry I. Three hours per week. Special course fees may apply. Corequisite or prerequisite, CHEM 3103. Credit for this course is contingent upon earlier or simultaneous completion of CHEM 3103. Fall, Spring, Summer.

**CHEM 3103. Organic Chemistry I** Study of the nomenclature, bonding, preparations and reactions of compounds of carbon, including aliphatic and aromatic hydrocarbons, haloalkanes, alcohols, and ethers. Lecture three hours per week. Special course fees may apply. Prerequisites, CHEM 1023 and CHEM 1021, **Grade of C or better in CHEM 1023**. Fall, Spring, Summer.

**CHEM 3111. Organic Chemistry II Laboratory** Laboratory skills illustrating the principles of Organic Chemistry II. Three hours per week. Special course fees may apply. Prerequisite, CHEM 3101. Credit for this course is contingent upon earlier or simultaneous completion of CHEM 3113. Fall, Spring, Summer.

**CHEM 3113. Organic Chemistry II** Continuation of Organic Chemistry I, including the study of phenols, aldehydes, ketones, carboxylic acids and their derivatives, amines, proteins, carbohydrates, lipids and nucleic acids. Spectroscopic methods of structure determination are also presented. Lecture three hours per week. Special course fees may apply. Prerequisites, CHEM 3103 and CHEM 3103, **Grade of C or better in CHEM 3103**. Fall, Spring, Summer.

**CHEM 3124. Physical Chemistry I** Systematic, rigorous development of fundamental chemical concepts presented in a unified lecture and laboratory format. Special course fees may apply. Prerequisites, PHYS 2044 or PHYS 2064, and MATH 3254. Fall.

**CHEM 3134. Physical Chemistry II** Systematic, rigorous development of fundamental chemical concepts presented in a unified lecture and laboratory format. Prerequisite, CHEM 3124. Spring.

**CHEM 3154. Survey of Physical Chemistry** A one semester course exploring the systematic development of fundamental chemical concepts. Special course fees may apply. Prerequisites, PHYS 2044 or PHYS 2064, MATH 2204 or MATH 2194, CHEM 3113. Spring.

**CHEM 4043. Environmental Chemistry** An overview of the chemistry of natural waters, soils, and the atmosphere. Emphasis will be on the chemical and biological agents which affect the quality of the environment. The most commonly used analytical techniques and quality assurance and control procedures will be covered. Special course fees may apply. Prerequisites, CHEM 3103 and CHEM 3101. Fall, even.