

Original date of review and posting: November 27, 2013.  
 Modified May 5, 2014 to reflect CSU GE Breadth for STEM as a GE option and Math 900S as an option to fill the Calculus requirement.

While the proposed TMC for Chemistry has been accepted by the Intersegmental Curriculum Workgroup (ICW), it can not be made available for degree development and submission to the Chancellor's Office until IGETC and/or CSU GE Breadth for STEM are fully implemented. The list of courses that compose the proposed TMC is presently being made available to the public for local review and consideration.

### Proposed Transfer Model Curriculum

CCC Major or Area of Emphasis: Chemistry

CSU Major or Majors: Chemistry

Total units 34 (all units are semester units)

Degree Type (indicate one): AS-T X

**“Core” Courses:**

34 units

Title (units)	C-ID Designation	Rationale/Potential GE applicability
General Chemistry for Science Majors Sequence A (10)	CHEM 120S	Required lower division preparation for major./CSU GE Areas B1 & B3.
Organic Chemistry for Science Majors Sequence A (8)	CHEM 160S	Required for major.
Calculus-Based Physics for Scientists and Engineers: A and B (8)	PHYS 205 and PHYS 210	Required lower division preparation for major.

**AND**

Single Variable Calculus Sequence (8) Or Single Variable Calculus I – Early Transcendentals (4) And Single Variable Calculus II – Early Transcendentals (4) Or Single Variable Calculus I – Late Transcendentals (4) And Single Variable Calculus II – Late Transcendentals (4)	MATH 900S  OR MATH 210  AND MATH 220  OR MATH 211  AND MATH 221	Required lower division preparation for major./CSU GE Area B4.  <b>2 semesters or 3 quarters of calculus, minimum 8 semester units.</b>
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## **\*Discipline Units 34**

\*This TMC presumes completion of IGETC or CSU GE Breadth for STEM, allowing for completion of 6 units of non-STEM GE work after transfer. Details regarding the implementation of IGETC for STEM are forthcoming.

### **Chemistry Review Summary**

The Chemistry FDRG discussed the appropriate preparation for students completing the first two years of a traditional four-year degree. The pattern is fairly consistent in that general chemistry, organic chemistry, physics and calculus are required for traditional third year courses in physical chemistry. The stipulation required by the law regarding the number of units is not nuanced enough to recognize the traditional, lower-division preparation required for most science majors.

The CSU faculty were concerned that a lack of physics preparation in the previous proposal did not service students adequately. Discussion regarding the CSU faculty hesitation regarding organic chemistry was also noted in that some institutions classify organic chemistry as upper division and there is resistance among CSU faculty chairs in chemistry to be required to accept non-local organic chemistry sequences. One of the primary concerns of CSU faculty is the instrumentation experience expected from students completing the organic chemistry sequence.

The community college faculty expressed concern that any degree for chemistry should include the year-long sequence of organic chemistry to be meaningful and distinct from preparation for physics or engineering. Also, adequate progress on a four-year traditional track is not possible without organic chemistry. It was noted that in traditional four-year plans published for students at nearly all universities, organic chemistry is listed as the sequence required by students in their second year of a four-year plan.

The TMC listed above is an effort to address the traditional, four-year plan for the well-prepared student. The language and intent of the law seems to be for the best prepared student to complete a bachelor's degree with a minimum amount of time and course work required. The other listed courses are typical preparation for the best-prepared student's first two years.

This TMC will require 26 additional units of general education to complete a modified transfer GE pattern that leaves 6 units of non-STEM GE work for completion after transfer for STEM majors. The mathematics requirement (up to 3 units) and laboratory science requirement (4 units) are double counted within the GE pattern and TMC bringing the total number of units to 60 required.