The Mathematics Transfer Model Curriculum

Approved March 24, 2011 – Updated January 4, 2013

CCC Major or Area of Emphasis: Mathematics

CSU Major or Majors: Mathematics

Degree Type: AS-T

Total Units: 18 units minimum

Required Core Courses (minimum of 12 units, all courses are universally required)

Title	Min Units	C-ID Designation
Single Variable Calculus I – Early Transcendentals Or Single Variable Calculus I – Late Transcendentals	4	Math 210 or Math 211
Single Variable Calculus II – Early Transcendentals Or Single Variable Calculus II – Late Transcendentals	4	Math 220 or Math 221
Multivariable Calculus	4	Math 230

OR

Single Variable Calculus Sequence (2 sem/3 quarters) Or Single Variable Calculus I – Early Transcendentals And Single Variable Calculus II – Early Transcendentals Or Single Variable Calculus I – Late Transcendentals And Single Variable Calculus II – Late Transcendentals	≥8	Math 900S or Math 210 and Math 220 or Math 211 and Math 221
Multivariable Calculus	4	Math 230

OR

Single Variable and Multivariable Calculus Sequence (3 sem/4 quarters)	≥12	

Choose a minimum of 6 units from below with at least 3 units from Group A.

Group A Provides Depth of understanding in subject major

Ordinary Differential Equations	3	Math 240
Linear Algebra	3	Math 250

OR

Differential Equations and Linear Algebra	5	Math 910

Group B Expands application of discipline

Discrete Math	3	Math 160
Calculus-Based Physics for Scientists and Engineers: A (Any course articulated as preparation for the physics major at a CSU)	4	Physics 205
Mathematical Computing Systems	1	*See sample.*
Computer Programming	3	Any programming course that is articulated preparation for the math major at a CSU.
Proof	3	*See sample.*
Introduction to Statistics	3	Math 110

NOTE: *All units are based on the semester and indicated minimum units. While 3 units are required from Group A, no units are required from Group B. The major must be a minimum of 18 semester units.*

Sample Course Descriptions:

Group B

Mathematical Computing Systems

Math 7 Mathematica (2)

Prerequisite: CAN MATH 18 (First Semester Single Variable Calculus)

Introduction to the computer software package Mathematica for math, science and engineering majors. Mathematica will be used in solving selected problems in algebra, trigonometry, calculus, vector and matrix analysis, data manipulation and presentation, complex analysis, etc., with emphasis on Mathematica's superior 2- and 3-dimensional graphical capability. 18 hours lecture and 54 hours computer laboratory.

(Riverside City College)

Proof

MATH 240. Introduction to Mathematical Thought (3).

Prerequisite: First Semester Single Variable Calculus or Calculus for Biological Sciences and Natural Resources or Calculus for Business and Economics.

Mathematical reasoning, writing, and proofs; sets, functions, topics in discrete mathematics, problem formulation, problem solving.

(Humboldt State)

Summary:
The Mathematics Transfer Model Curriculum (TMC) was developed in response to SB 1440 using a process implemented by the Academic Senate for California Community Colleges. The Math TMC was initially developed by faculty at the October 2010 DIG (Discipline Input Group) meetings. Both the North and the South groups readily agreed upon the required core courses. A guiding principle for those courses included in Groups A and B of the TMC was the likelihood that all California Community Colleges (CCC's) offer at least one course in Group A and if necessary, at least one course in the Group B. Enough choices were included so that it is believed that each CCC could offer a transfer degree in the Mathematics major. After the DIG meeting the FDRG (Faculty Discipline Review Group) met and created a draft of the TMC. The TMC was posted on the Academic Senate website and comments were requested during the period of November to December 1, 2010. After the vetting period, the FDRG reviewed the comments and noted that even though there were over 300 Math faculty who reviewed the TMC, there was not enough input from the CSU faculty. Moreover, it was apparent from the comments that there was a lack of understanding of the implementation of the TMC. The FDRG decided to have a second round of vetting where an overview of the TMC process and a re-vamping of the questions were needed. The second round of vetting was conducted in January and February of 2011. In addition, the designated CSU Lead relayed the draft to the Chairs of CSU Departments of Mathematics and collected this crucial feedback. After the vetting, the FDRG again reviewed the submitted comments.

The FDRG received comments from the majority of the Chairs from the CSU and CC faculty. Below are some of the concerns and the FDRG's responses.

Concern: Not all their math degrees can be completed in 60 units
Response: Most CSUs do offer at least one math degree that can be completed in 60 units

Concern: One course in Group A is upper-division at certain CSU
Response: Their local CC Associate degree in Math Transfer would not include this course. The CC would choose an acceptable course from Group B
Alternate Response The student takes the course at CCC and then takes a different upper division course at CSU.

Concern: Faculty members from some CSUs believe the students should take all of Group A at CSU.
Response: Chairs at their corresponding CSU replied that the TMC is acceptable.

Concern: One CSU would require 9 units from Group A and B
Response: The course that could be included is Physics. This course would fulfill the GE requirement for Scientific Inquiry and Quantitative Reasoning.

Concern: Some of our courses have a higher unit value then those presented in the TMC.
Response: The additional math units could be "double counted". That is, a math course would also fulfill the GE requirement for Quantitative Reasoning.

The Mathematics TMC was unchanged following the vetting period. Many of the comments and concerns are readily addressed with a clear explanation of reasoning behind the courses selected for the TMC. Other concerns suggested a lack of understanding of the implementation of the TMC; a failure to understand that CCCs were not obligated to develop degrees with all indicated course offerings and/or that a given CCC that seeks to develop a TMC-aligned degree could opt to be as restrictive or permissive as they choose within the parameters of the TMC. The FDRG also discussed that the fact that while the TMC will offer a “fast track” option for degree completion and transfer, other degree and non-degree options are still available for CCC students, including CCCS that additionally continue to offer an existing degree in math with more requirements/units than the transfer degree.