Mathematics & Engineering with Teaching B.S Proposed 4/3/2013 Ridenour & Baird

Rationale:

1. Prepare high school math teachers who can teach a high school intro to engineering elective
2. Prepare high school math teachers who can use engineering examples in their math classes

Degree is essentially the existing Mathematics with Teaching B.S. plus two “foundational” engineering courses, and two “specialized” courses that might be taken in one of four concentrations

The specialized courses emphasize 1) an exciting/ timely topic 2) a focus that lends itself to laboratory development, projects, and field trips, and 3) a topic to that would encourage high school students to consider a STEM field in college.

Proposed to include a total of 12-14 non-math and non-phys Engineering credits. One UL Math elective would be dropped from the major due to the mathematical nature of the advanced engineering courses required. The credits for the Math-Engineering with Teaching major would then be:

Math credits: 42

CIS credits: 4
CIS 1053, 1057, or 1068

Phys/Chem credits: 8 (Physics 1061 and 1062, OR Gen Chem I & Lab and Gen Chem II & Lab) (sequence required to meet GenEd requirements.)

TUteach “Pedagogical” credits: 2 + 15 + 7 = 24
CST 1189 Step-1 & CST 1289 Step-2 2 sh OR CST 1389 Step-1/Step-2 2 sh
Ed 2179 Knowing & Learning 3 sh
Math Ed 2189 Classroom Interactions 3 sh
Special Ed 2231 3 sh
Secondary Ed 3796 Differentiated Literacy Instruction in the Disciplines, 7-12 3 sh
Math Ed 4189 Project Based Instruction 3 sh
Ed 4388 TUteach Apprentice Teaching: 6 sh
Ed 4802 TUteach Apprentice Teaching Seminar 1 sh

TUteach CLA credits: 3
Phil 2196 Perspective on Science & Math 3 sh

TUteach Research credits: 3
Bio/Chem/ESS/Phys 3091 Research Methods 3 sh

TUteach Functions & Modeling credits:
Math 2021 Functions and Modeling 3 sh
Engineering credits: 12-14 in one of four concentrations

1. Common Foundation courses:
   a. ENGR 1102 Intro to Engineering 3 sh
   b. ENGR 1117 Graphics – AutoCAD 3 sh

2. Four Engineering Concentrations:
   a. Civil Engineering – Area of the Environment:
      EES 2001 Physical Geology 4 sh
      AND
      CEE 2711 Environmental Chem & Microbio 3 sh Prereq Gen Chem 1&Lab
      OR
      CEE 3711 Environmental Engineering 3 sh Prereq Gen Chem I&Lab, Calc II
   b. Electrical Engineering – Area of Robotics
      EE 2312/13 Elect Dev & Sys with Lab 4 sh Prereq Physics I&II
      AND
      EE 2612/13 Digital Circuits with Lab 4 sh Prereq EE 2312
   c. Mechanical Engineering – Area of Energy
      ENGR 3571 Thermodynamics 3 sh Prereq Calc I&II, Phys II
      AND
      MEE 4575 Renewable/Alternative Energy 3 sh Prereq ENGR 3571
      OR
      MEE 4576 Photovoltaic System Design for Engineers 3 sh Prereq ENGR 3571
   d. Bioengineering
      BIOE 2001 Principles of Bioengineering 3 sh Prereq BIOL 1001 waived
      AND
      BIOE 3725 Cell Biology for Engineers 3 sh
      OR
      BIOL 3334 (Mammalian Physiology 3 sh

Elective credits: 3-6

Total credits: 122-124