



Redefining Developmental Math for Non-Algebra Core Math Courses

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Disclaimers

- We don't have all the answers.
- We don't even have all the questions!
- Your mileage may vary. (It may be that nothing in this presentation will apply to your institution's situation.)

Current Structure

All Tennessee Board of Regents (TBR) schools use this rubric for now:

- DSPM 0700 Prealgebra
- DSPM 0800 Elementary Algebra
- DSPM 0850 Intermediate Algebra

All courses are 3 hours and do not count towards graduation.

- Mandatory placement based on ACT or COMPASS scores
- ACT cutoff score is 19
- Students placed based on ACT may challenge placement by paying to take COMPASS.
- Other courses: English (DSPW), Reading (DSPR); learning strategies (DSPS) if placed in ≥ 2 areas

Placement: ACT (Current)

- Placement based on ACT subscores if scores less than 3 years old
- $ACTM < 17 \rightarrow DSPM 0800$
- $ACTM = 18 \rightarrow DSPM 0850$
- $ACTM \geq 19 \rightarrow MATH$
- SAT equivalents: 440, 450, 460

Placement: COMPASS

- Prealgebra $\leq 29 \rightarrow DSPM 0700$
- $30 \leq \text{Prealgebra} \leq 99$ and $20 \leq \text{Algebra} \leq 29 \rightarrow DSPM 0800$
- $28 \leq \text{Algebra} \leq 49 \rightarrow DSPM 0850$
- Algebra $\geq 50 \rightarrow$ College level math

ETSU's Situation (Here's where your mileage may vary.)

- About 90% of our students do NOT take an algebra-based course (such as college algebra, precalculus, calculus) for graduation. These students take MATH 1530, Probability and Statistics, as their core math class.

- Very little intermediate algebra is used in this course.
- Mostly majors in math and the sciences take something other than prob & stat for graduation, and they are required to take one semester of calculus. (Digital media majors take both P&S and trig.) These students benefit from intermediate algebra.

Background Information (How did we get to this point?)

Defining Our Future (2002)

DSP-Specific

- Flexible delivery
- Reduce credit hours to 3 per course (really only affected community colleges)
- Reduce DSP costs at universities to community college level.
- Align standards for high school graduation with standards for higher education admission.
- Teach remedial (0700) courses only at community colleges.

Defining Our Future -- General

- Associate's degree: 60 hours
- Bachelor's degree: 120 hours
- Common calendar across TBR
- Broad common general education core for easy transferability.

Defining Our Future -- Recommended for future consideration:

- Alternate assessments (e.g. ACT subscores)
- Revise guidelines for DSP to encourage flexibility and innovation
- Improve teacher education
- Align teacher ed, high school, college curricula

Redesign Initiative (2007+)

- TBR got large FIPSE grant to go to 5 or 6 institutions to pilot alternate ways of delivering DSP
- Dual emphases: Cost savings and technology
- Coordinated through NCAT, National Center for Academic Transformation (www.thencat.org)

NCAT's Redesign Models

- Supplemental
- Replacement
- Emporium
- Online
- Buffet

Our Redesign Proposal -- What did we think we would do?

- Re-vamp DSPM 0800 to make it a better preparation for statistics
- Delete DSPM 0850 requirement for students not taking precalculus or other algebra-based courses

Same Topics, New Sequence

- What concepts do the statisticians think the incoming students need?

Emphasize:

- Order of operation, especially distributive property, even when using a calculator
- Comparing (order) fractions, decimals, percents, and signed numbers
- Interpret numerical answer—(what does it mean?)
- Estimation: does the answer make sense?
- Percent, proportions, decimals
- Solving and graphing linear equations
- The language of inequalities

Our Proposal – Technology

- Use My Math Lab, Hawkes Learning, or similar programs with both courses
- Alternate days between lecture classroom and computer lab as is done with statistics course
- Do spreadsheet activities in elementary algebra to prepare students for Minitab
- Use graphing calculator in elementary algebra to prepare for stat and in intermediate algebra to prepare students for precalculus
- Envisioned Advantages
- Cost savings: Cut back on sections of 0850 from ~12 each semester to ~3 or 4.
- Prepare students for courses they would actually take
- More individualized help with computer programs and developmental math tutors

Disadvantages

- Administration would be difficult
- What about students who placed in 0850? Move them on in to 1530 or put them in 0800?
- What about students who change to science major after finishing 0800→1530?

Our proposal wasn't funded. What pilot projects were?

- Descriptions at <http://www.thencat.org/States/TN/TN%20Project%20Descriptions.htm>
- Emporiums
- Paired/compressed classes
- Modularized classes
- Small class meetings, big labs

TBR DSP Redesign

- Subcommittees working in all areas including math
- Align with Tennessee high school exit standards
- This year's 7th graders (Class of 2013) will have to take math all 4 years of high school!
- New math curriculum standards based on NCTM, ADP, ACT, NAEP, . . .

Math Redesign Subcommittee

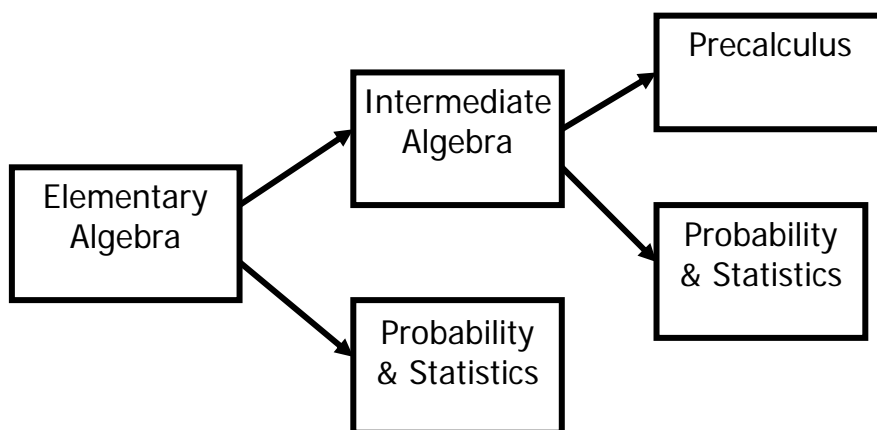
- Subcommittee includes university, community college, and high school faculty
- Currently surveying math and other faculty across TBR to see what math is actually needed in intro and gen-ed courses
- Some thought given to multiple exit points
- More questions than answers at this point

Committee's Charge

- Examine *what* should be taught, *when*, and *why*.
- Pilot programs help decide *who*, *how*, and *where*.

What to do now?

Proposed Sequences



DSPM 0800 Content (proposed)

1. Review of Real Numbers

- 1.2 Symbols and Sets of Numbers
- 1.3 Fractions
- 1.4 Introduction to Variable Expressions and Equations
- 1.5 Adding Real Numbers
- 1.6 Subtracting Real Numbers
- 1.7 Multiplying and Dividing Real Numbers--Operations on Real Numbers
- 1.8 Properties of Real Numbers

2. Equations

- 2.1 Simplifying Expressions
- 2.2 The Addition and Multiplication Properties of Equality
- 2.3 Solving Linear Equations
- 2.4 An Introduction to Problem Solving
- 2.5 Formulas
- 2.6 Percent
- 2.8 Linear Inequalities

3. Graphing

- 3.1 Reading Graphs & the Rectangular Coordinate System
- 3.2 Graphing Linear Equations
- 3.3 Intercepts
- 3.4 Slope and Rate of Change
- 3.5 Slope-Intercept Form: $y = mx + b$
- 3.7 Functions

5. Exponents and Polynomials

- 5.1 Exponents

9. Inequalities and Absolute Value

- 9.1 Compound Inequalities
- 9.4 Linear Inequalities in Two Variables and Systems of Linear Inequalities

10. Radicals, Rational Exponents

- 10.1 Radicals and Radical Functions

■ This presentation will be on Daryl's faculty web page:

<http://faculty.etsu.edu/stephen/handouts.htm>

Look for links from that page.

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