A. Course Description

- Credits: 4.00
- Lecture Hours/Week: 4.00
- Lab Hours/Week: 0.00
- OJT Hours/Week: 0
- Prerequisites:
  - MATS 0600: Intermediate Algebra
  - MATS 0700: Algebra Emporium
- Corequisites: None
- MnTC Goals:
  - 04 – Mathematical/Logical Reasoning

A course combining elements of college algebra, college trigonometry, and statistics, with a particular focus on topics useful to future engineers or engineering techs. Manipulating literal equations; solving equations analytically and by graphing; identifying, analyzing, and specifying linear, quadratic, polynomial, power, reciprocal, exponential, logarithmic, and sine/cosine functions; solving systems of equations analytically and using matrix solvers; setting up and solving systems of equations for practical applications; trigonometric functions; laws of sines and cosines; vector analysis of forces in static equilibrium; basic concepts of probability; bell curve; confidence intervals and uncertainty analysis; correlation and regression.

B. Course Effective Dates: 1/31/19 – Present

C. Outline of Major Content Areas

   As noted on course syllabus

D. Learning Outcomes

1. Apply concepts of trigonometry (including laws of sines and cosines) and plane geometry in various applications such as surveying, architecture, and machining.
2. Construct confidence intervals and perform uncertainty analysis for a series of measurements (including zeroth, first, and nth-order sources of uncertainty).
3. Estimate lengths, areas, and volumes of regular and irregular geometries.
4. Increase proficiency working with literal equations and engineering notation, including significant figures (the electrical power wheel being a good example).
5. Perform least-squares analyses, including correlation and regression.
6. Use vector analysis to analyze static equilibrium in trusses and other structures.
7. Write and solve systems of equations (using matrix solvers for high-dimensional systems) with applications to DC circuit analysis (Kirchhoff's laws), static equilibrium in a truss, thermal conduction in a uniform solid, and other situations.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

Goal 04 — Mathematical/Logical Reasoning

1. Illustrate historical and contemporary applications of mathematical/logical systems.
2. Clearly express mathematical/logical ideas in writing.
3. Explain what constitutes a valid mathematical/logical argument (proof).
4. Apply higher-order problem-solving and/or modeling strategies.

F. Learner Outcomes Assessment

As noted on course syllabus

G. Special Information

None noted