Course Outcomes Guide (COG)

Course Title: EGR 108 Statics **Update Date: 8/21/2014**

Course Team: Ed Sigler

Expected Learning Outcomes

1. Utilize vector components and vector mathematics (addition, subtraction, dot and cross product) to analyze forces and moments
2. Perform a thorough force analysis of rigid bodies and simple structures in equilibrium.
3. Draw clear and appropriate free-body diagrams.
4. Analyze trusses, beams, frames and machines.
5. Determine the centroids, centers of gravity and moments of inertia of simple geometric shapes and understand the physical applications of these properties.
6. Perform calculations related to friction forces in various engineering applications.
7. Determine internal forces and produce shear and moment diagrams for beams subjected to various loadings.

Assessment

Learning outcomes are assessed through homework problems, midterm exams, and the final exam. A design project will be developed and introduced with in FA 2104. Common questions for each exam are given to each section of the course. Data collected from these exams will be used to identify areas of weakness and to adjust instruction accordingly.

Validation

See the assessment section above.

Results

For Spring 2014, student assessments demonstrated that student learning objectives were met. However, based on detailed analysis, improvement can be made in four areas: trusses, distributed loads, friction and internal shear and moment diagrams.

Also, MAT 203 (Calc 1) is a co-requisite for this course. Unfortunately, EGR 108 'hits' certain topics requiring familiarity with calculus concepts such as integrals prior to MAT 203 teaching such concepts. For such students, the instructor must make time to provide additional assistance for these students during class and outside of the classroom.

Follow-up

Improvement will be implemented via the following:

1. Additional instruction and examples for friction, potentially with in-class demonstrations.

2. Additional instruction and examples for distributed load problems.

3. Additional instruction and examples for internal shear and moment diagrams, potentially using computer analysis demonstrations.

4. A three-person team project will be added to emphasize truss analysis. The teams will be required to design and build a balsa-wood truss bridge with a 24" span that must hold 24 pounds. The project includes design and analysis of each truss member to ensure appropriate loading along with a final report detailing the analysis and results.

5. Supplemental instruction for integration as applied to center of mass, distributed loads and moment of inertia concepts.

Budget Justification

Balsa wood and other materials necessary to build a 24" truss bridge must be purchased for 1) 6 three-person teams in FA14 and 2) 12 three-person teams in SP15.

Course: EGR 108 SLOA Data **Faculty Team: E. Sigler**

	SU 2012	FA 2012	SP 2013	SU 2013	FA 2013	SP 2014	SU 2014	FA 2014	SP 2015	SU 2015	FA 2016	SP 2016	SU 2016
# Active students	N/A	N/A	20	N/A	N/A	31	N/A						
%W			25%			0%							
*# walk-away Fs No final exam/grade = F			2			1							
% Success (A,B,C)			53%			87.1							
Common Comprehensive Final Exam Score Average			72.5% N=13			79.3 N=30							
Mean course grade			1.87			2.81							
Item Analysis **Weakest Content Areas**			Vector math			1) Trusses 2) Dist. Loads 3) Friction 4) Shear/ Moment Diagrams							

*% Walk-away Fs = Did not take the final exam and received a grade of F.