BOTTLENECK CLASSES & STUDENT SUCCESS

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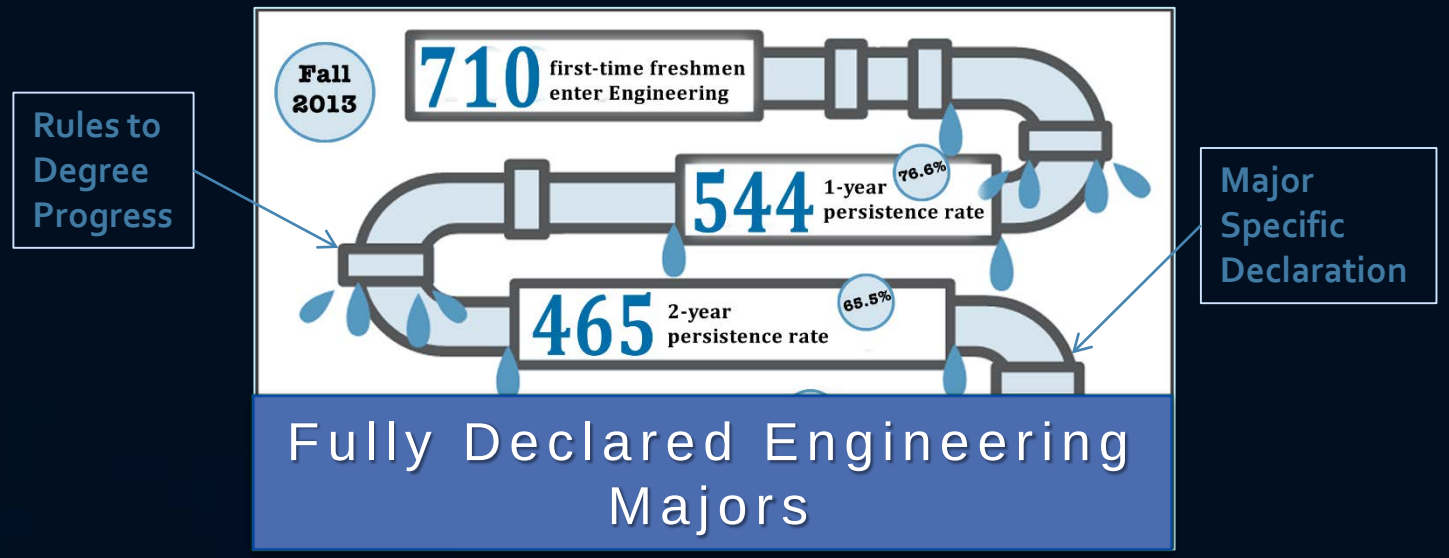
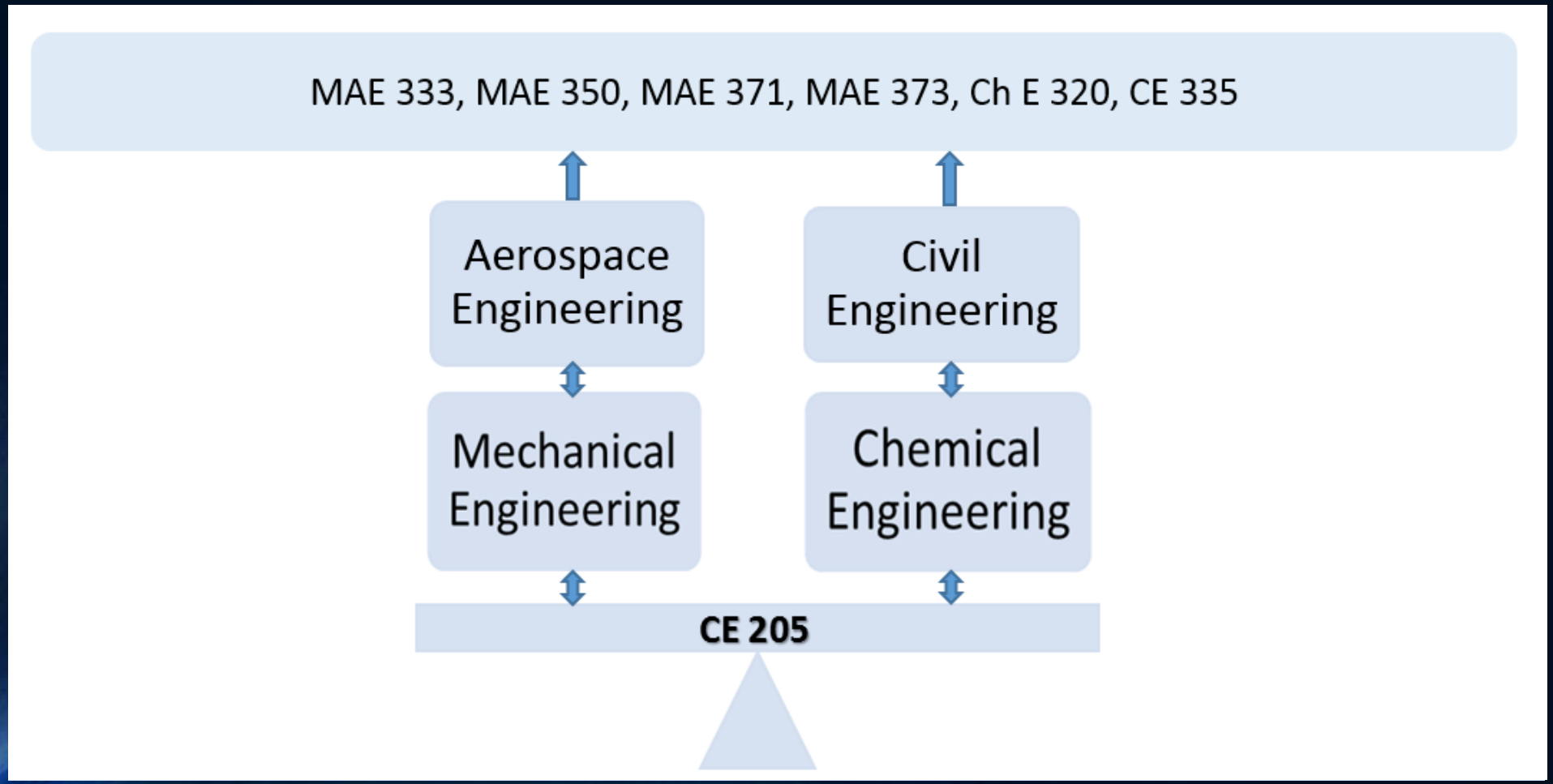
COLLEGE OF ENGINEERING

A long time ago in data fellows far, far away…

- Examining the Engineering Pipeline
- When do students leave engineering/computer science majors?
- Why do students leave engineering/computer science majors?



CE 205 & COE Impacts



Fall 2012 Snapshot…

224 Taking Class for 1st Time

13 students repeating the class

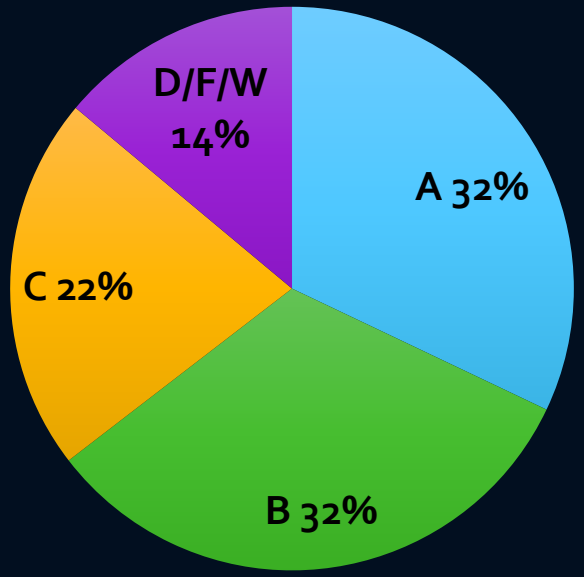
CE 205

237 Students Enrolled

204 PASS

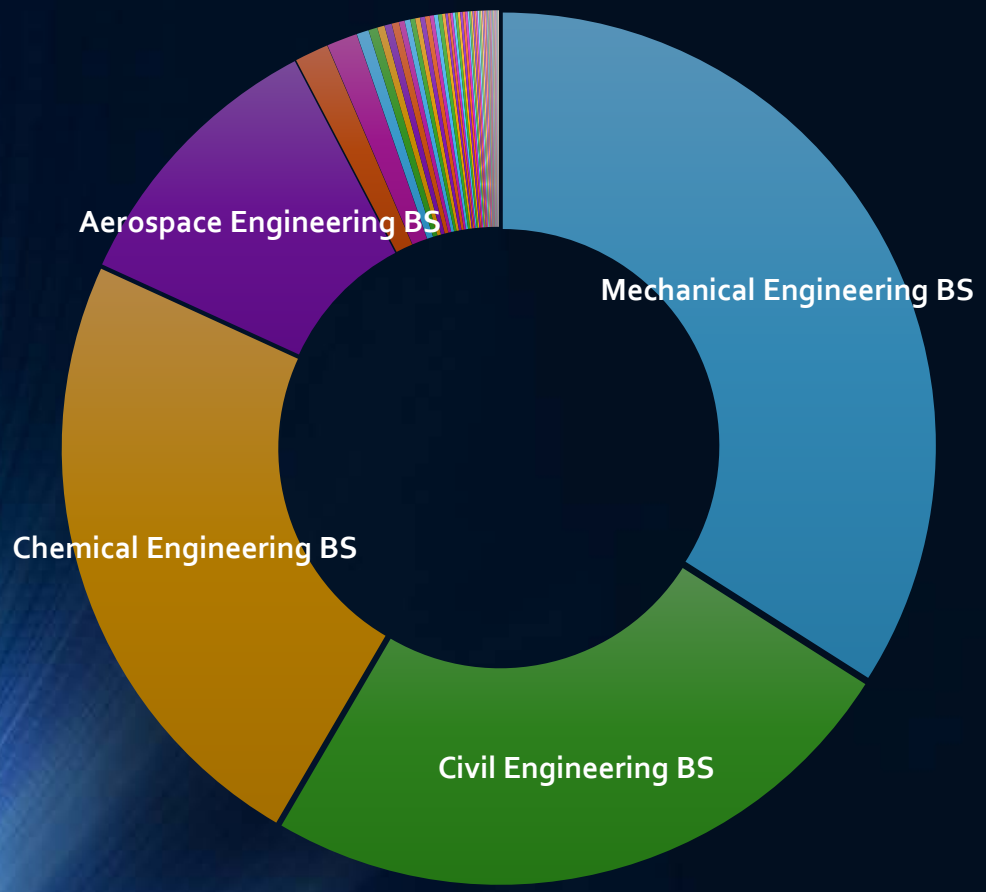
27 DFW and Repeat

5 Never Retake



82.70% of students have graduated in 5 years	
Aerospace Engineering	33
Chemical Engineering	16
Civil Engineering	47
Construction Management	4
Electrical Engineering	1
Mechanical Engineering	86
Other Majors	9

CE 205 Students
Final Majors at Graduation

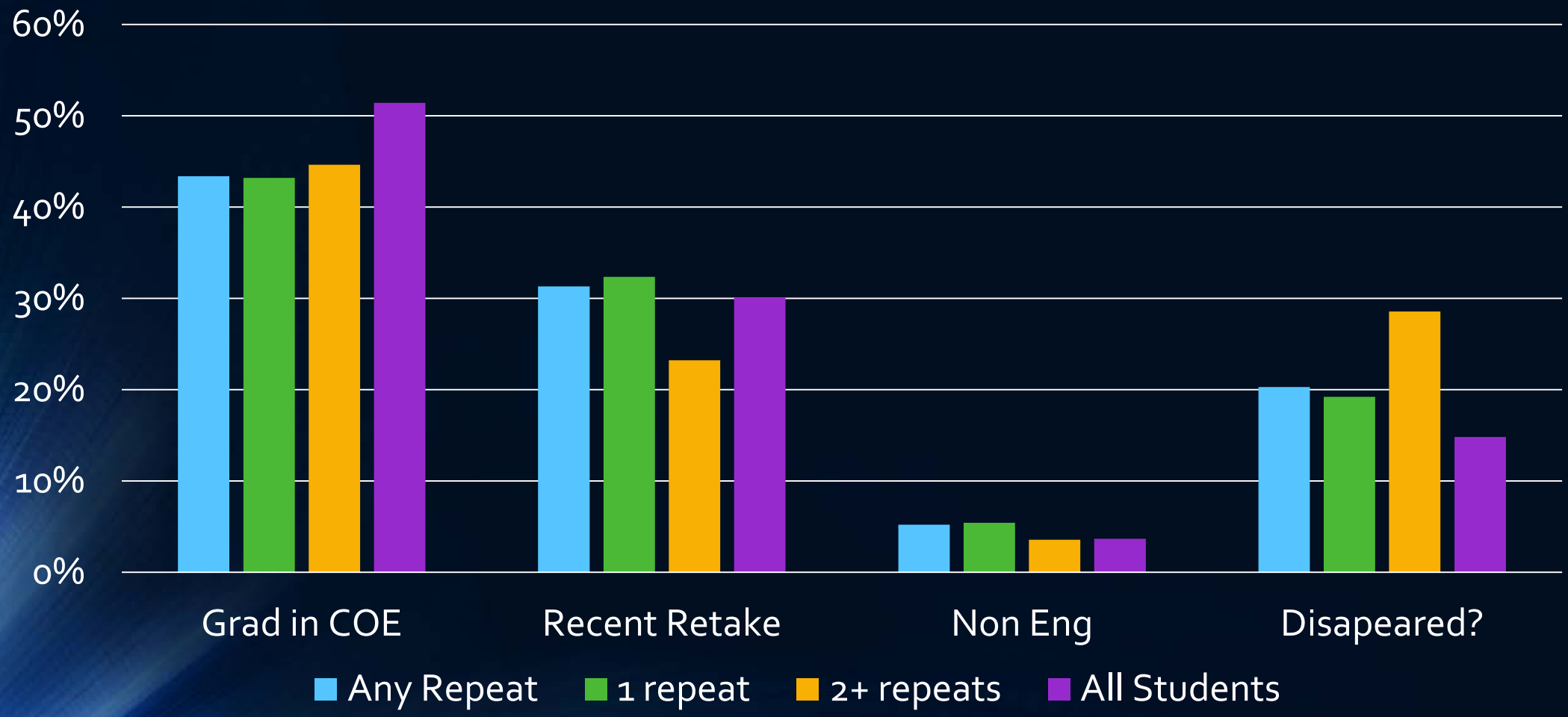


- Mechanical Engineering BS
- Civil Engineering BS
- Chemical Engineering
- Aerospace Engineering BS
- Construction Engr Mgmt BS
- Math BA & BS
- Physics BS
- Geography BA
- Business Economics BA
- Economics BA
- Electrical Engineering BS
- Engr-Industrial Mgmt Engr BS
- Finance BS
- Communication Studies BA
- Computer Science BS
- FCS Consumer Affairs BA
- Manufact Engr Technology BS
- Biochemistry BS
- Mangement BS
- Marketing
- American Studies BA
- Accountancy BS
- Biology BA & BS
- Chemistry
- Earth Science BS
- Electronics Engr Tech BS
- Health Care Administration BS
- KIN BS
- Philosophy BA
- Psychology BA
- Comm Stds Interp Org Comm BA
- Computer Engineering BS
- Engr-Materials Engineering BS
- Environmental Sci & Policy BA
- Geographic Info Science MS E
- Geology BS
- Geology MS
- Human Resources Management BS
- Oper Supply Chain Mgmt BS
- Political Science BA
- Sociology BA
- Applied Statistics MS
- Art Graphic Design BFA
- Asian Studies BA
- Chicano & Latino Studies BA
- Crim/Criminal Justice BS
- Design BA
- English Educ BA
- English Lit BA
- FCS Fashion Design BA
- History BA
- Human Development BA
- Italian Studies BA
- Journalism
- MicrobiologyBS
- Nursing BS
- Performance BM

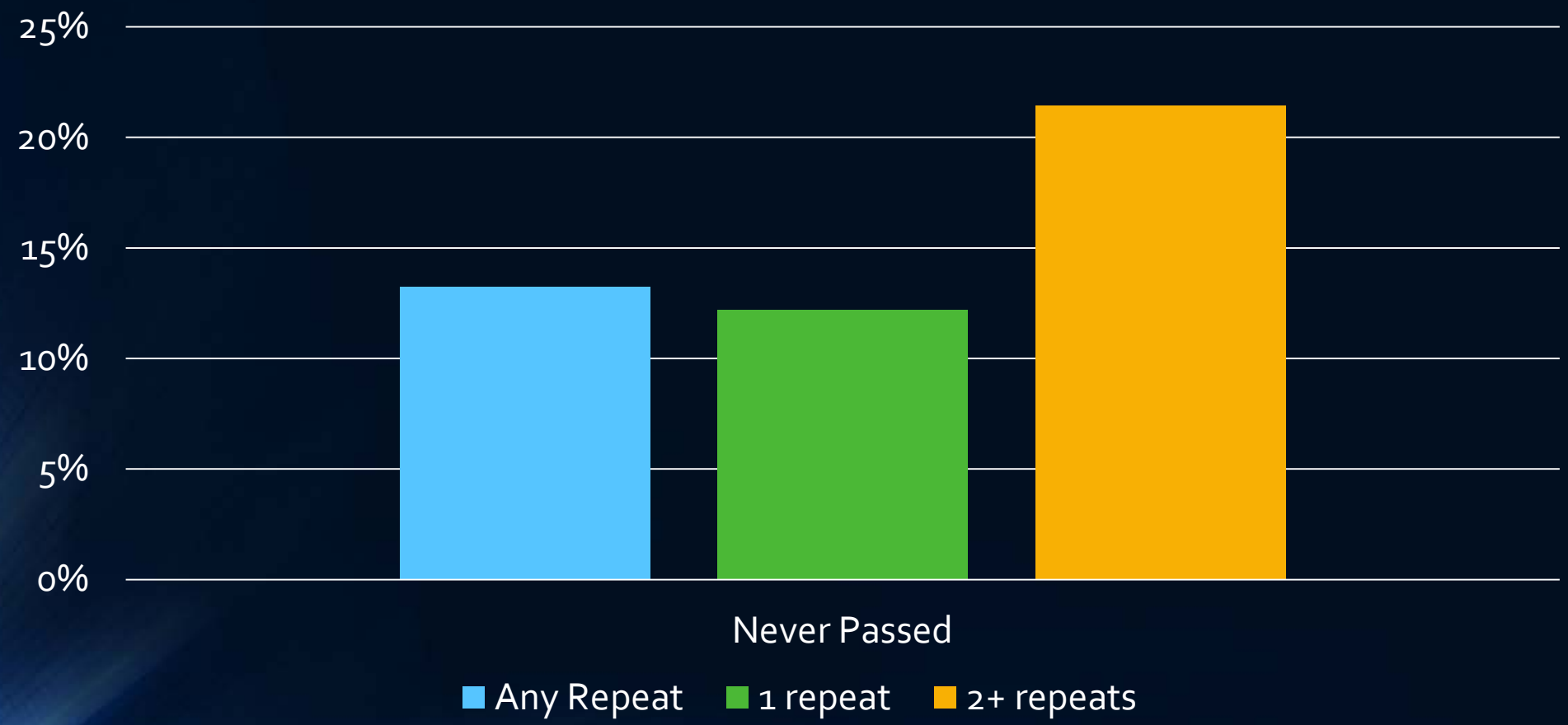
Students Who Repeat

- 4454 Students took CE 205 from Spring 2005 –Fall 2017
- 498 Students Repeated (11% of all students)
  - 442 Repeated 1 time (89% of repeating students)
  - 56 Repeated 2+ times (11% of repeating students)

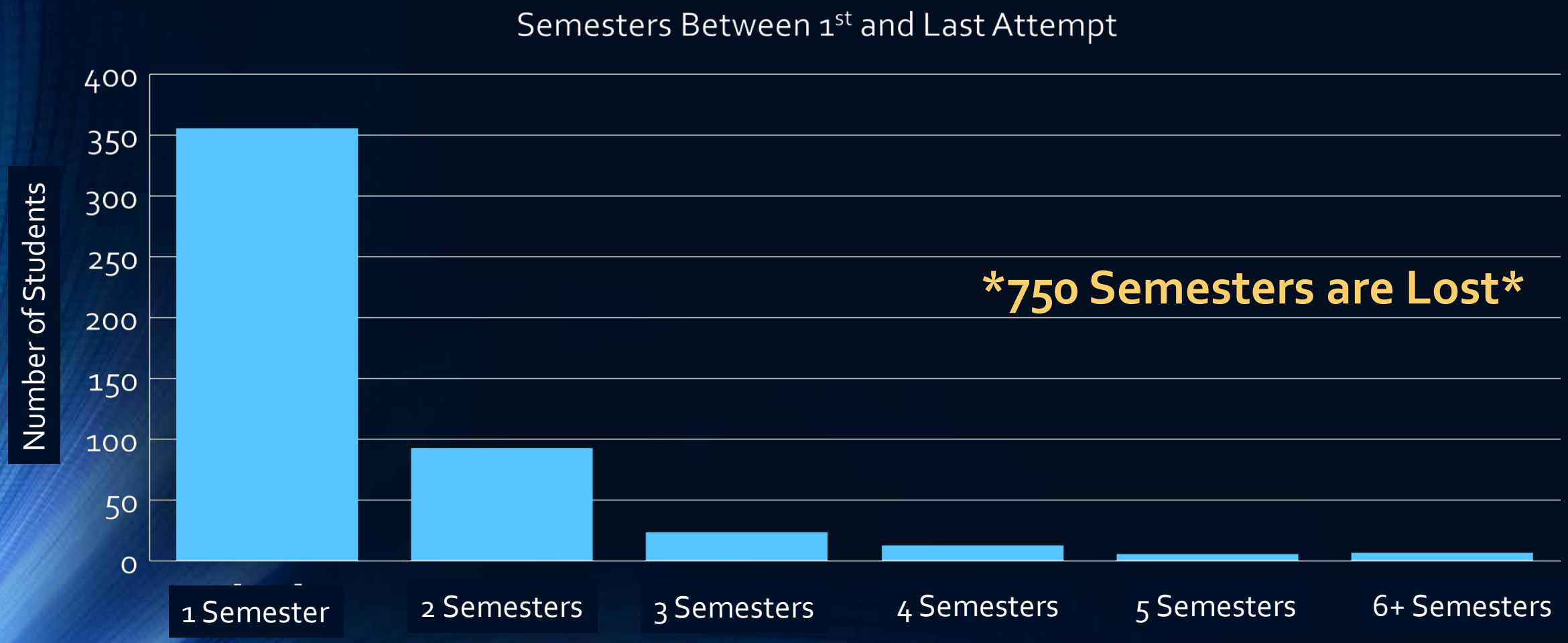
Success of Students Who Repeat



Students who repeat CE205

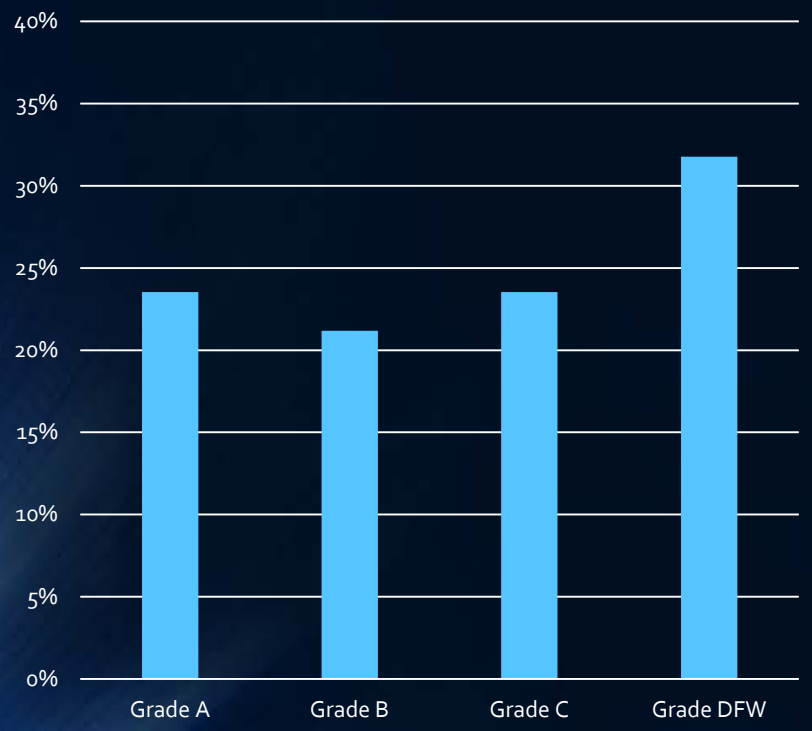


How Many Semesters are Lost?

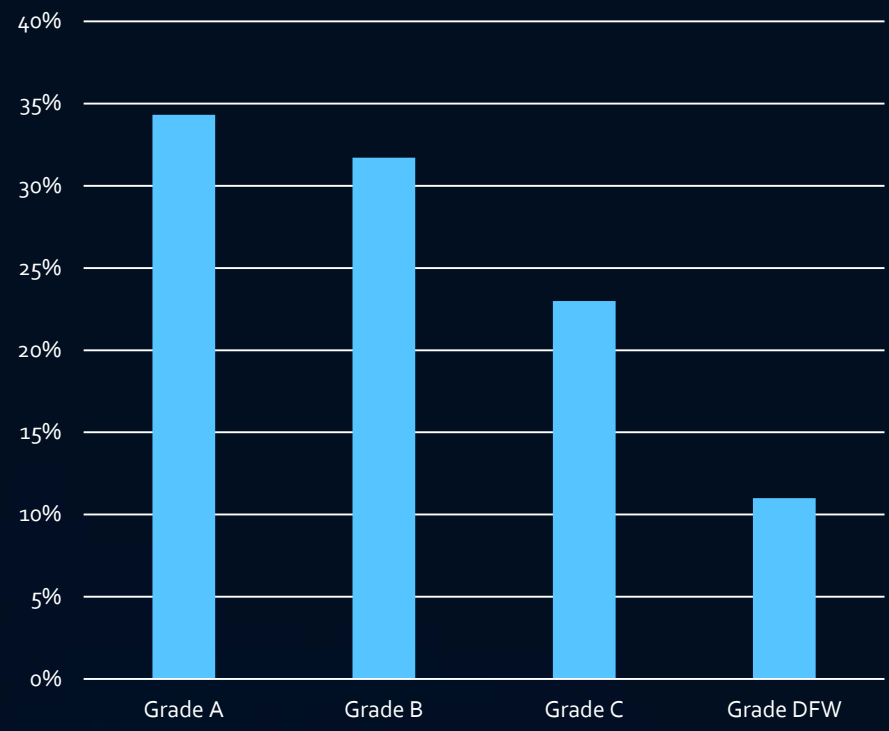


CE 205 Grades Earned

Non-COE degree conferred students
N=170

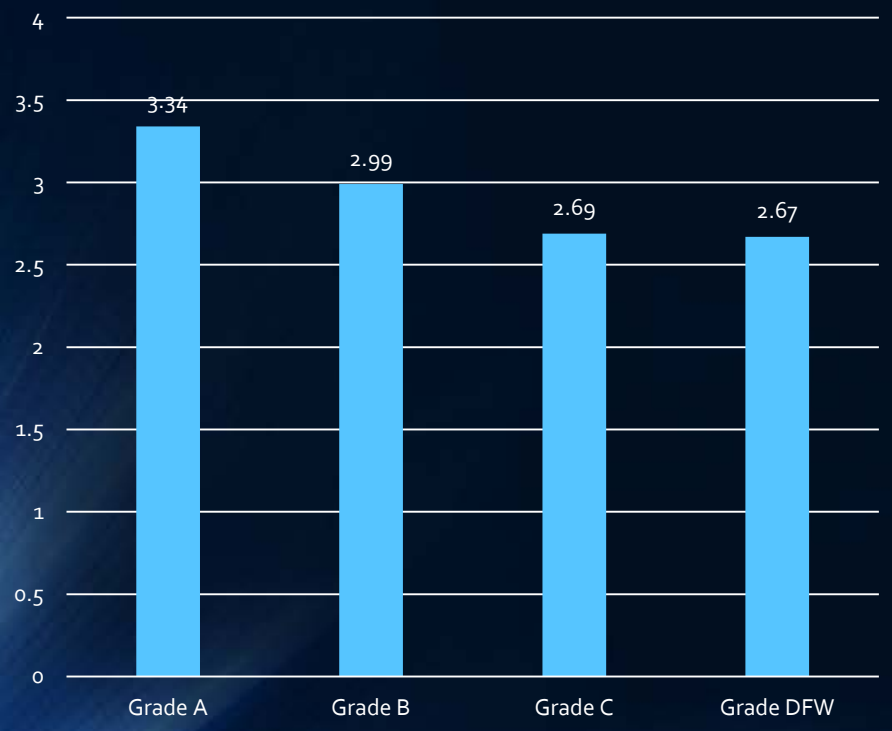


Students who started and ended in COE
N=2454



CE 205 Grades Earned & Graduating GPA

Non-COE conferred degrees
N=170



Students who started and ended in COE
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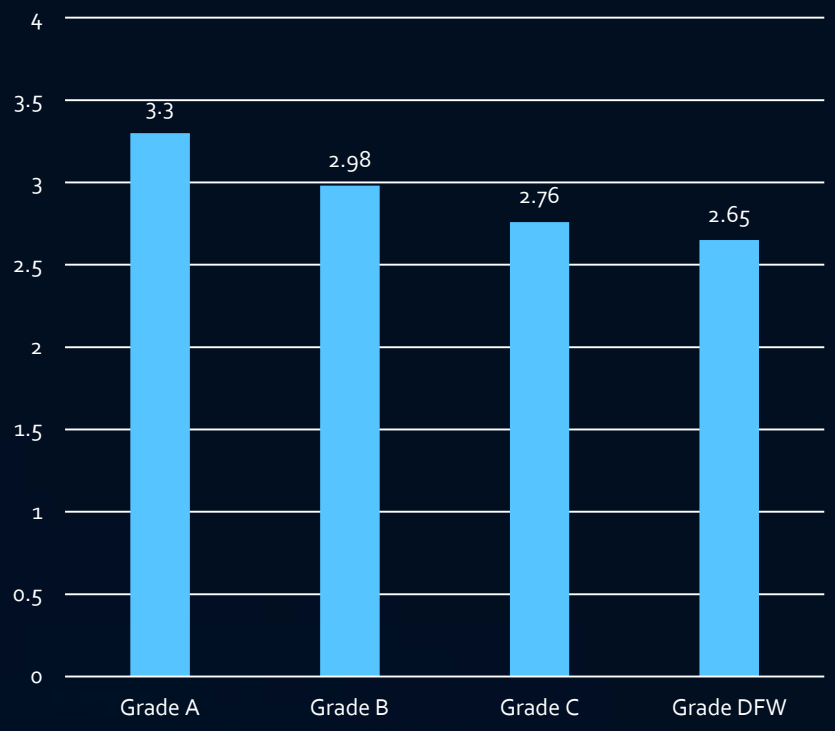


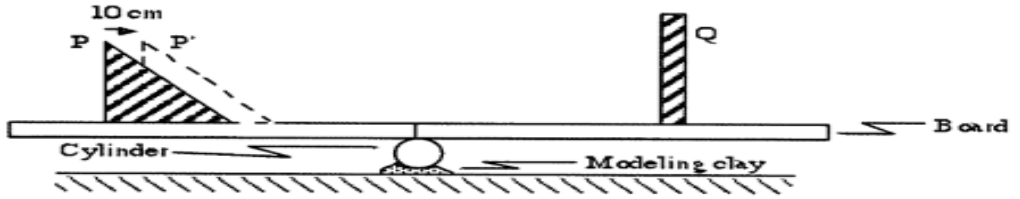
Problem Analysis of CE 205

LESSONS LEARNED AND NEXT STEPS

Success in Engineering is a Balancing Act

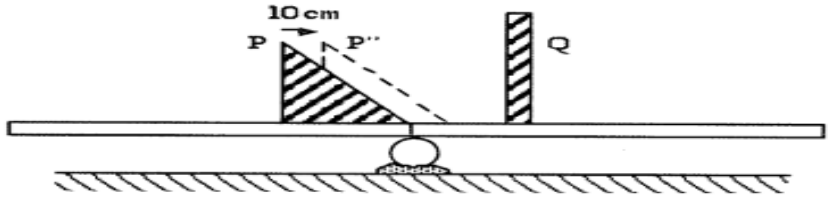
A uniform board is balanced at its midpoint on a cylinder. Two objects P and Q, of equal mass, are placed on either side of the fulcrum so that the board remains balanced.

1. Object P is then moved 10 cm to the right, to position P as shown.



To keep the system balanced, should object Q be moved toward the fulcrum a distance *greater than*, *less than*, or *equal to* 10 cm? Explain.

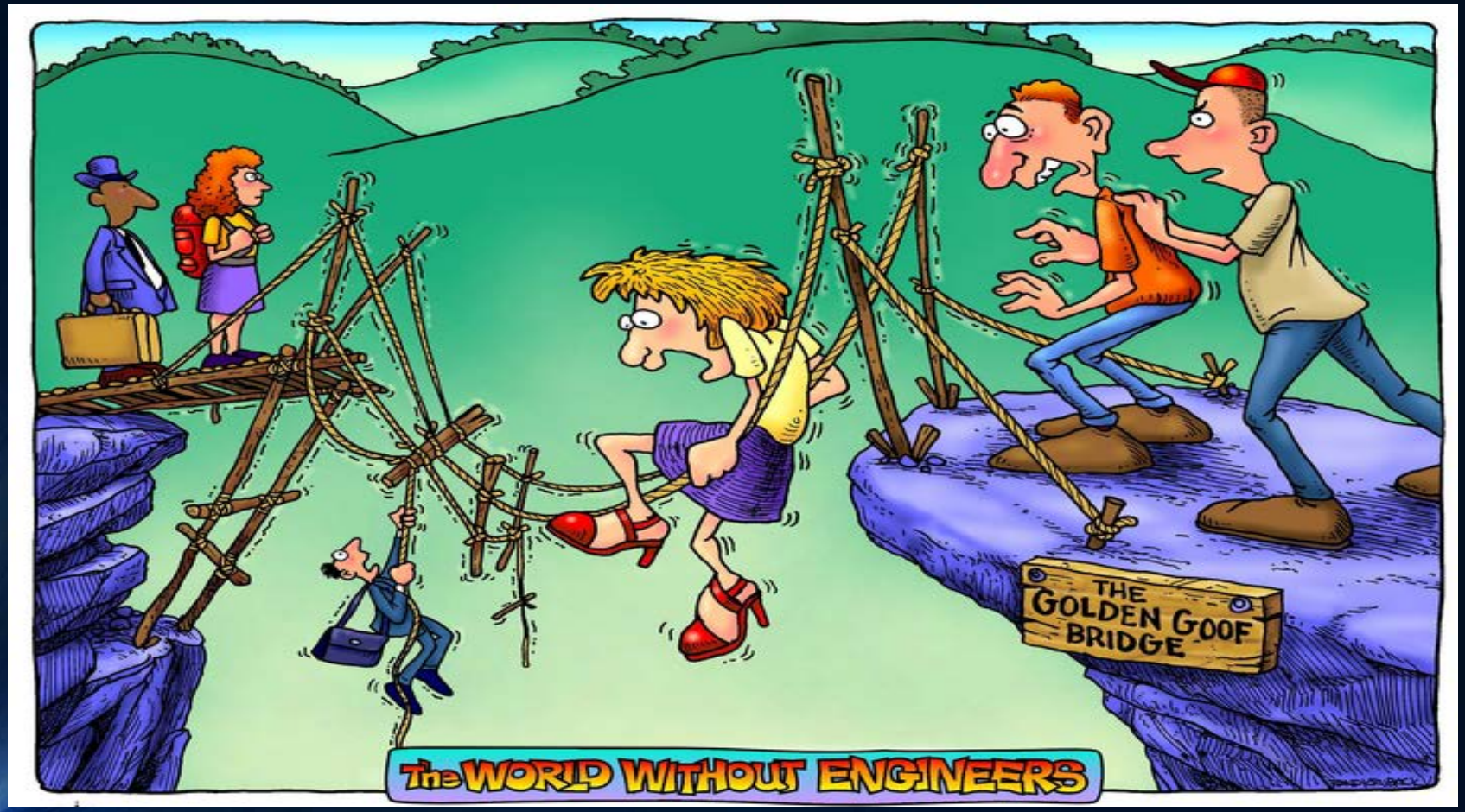
2. The board is balanced again with objects P and Q at new positions. Object P is then moved a distance 10 cm to the right, to position P.



To keep the system balanced, should object Q be moved a distance *greater than*, *less than*, or *equal to* 10 cm? Explain.

Figure 1. Excerpt of pretest about triangle and rectangle on beam for *Equilibrium of rigid bodies.*

Real World Engineering Problems



Future Interventions

- ESSC Tutoring Center to coordinate with CE 205 faculty to identify students based on pretest results and/or grades in prerequisite courses and offer early semester workshops
  - Refresh basic math and physics skills
  - Focus on problem analysis and solving skills
- Introduce general problem solving skill development practices, increase visual-spatial activities, along with metacognitive approaches into freshmen introductory courses (I.e. ENGR 101 & ENGR 102)
- Opportunities for faculty to explore best-practice pedagogy for related courses