

### Mastering Mechanics of Materials Through Team-Based Learning

**Authors:** **Alejandro Maraño, Ph.D.**  
Associate Professor of Mechanical Engineering, Universidad de Los Andes  
**Diana Carolina Cortés Bolívar, M. Ed.**  
Pedagogical Consultant for Educational Projects, Universidad de Los Andes  
**Alexandra Ramírez Zarate, M. Ed.**  
Technology Consultant for Educational Projects, Universidad de Los Andes  
**Helmman Cantor Hernández**  
Evaluation Consultant for Educational Projects, Universidad de Los Andes

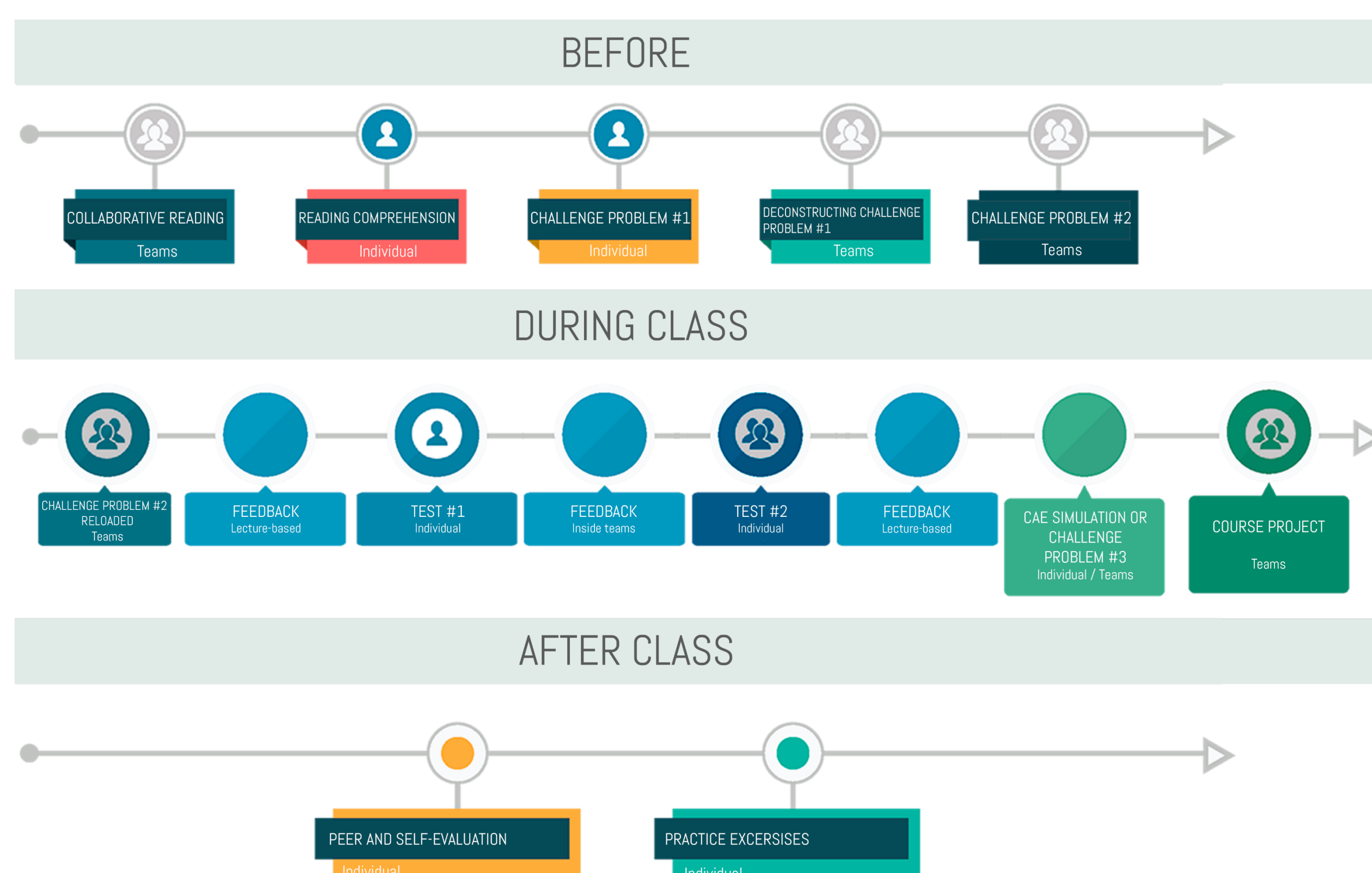
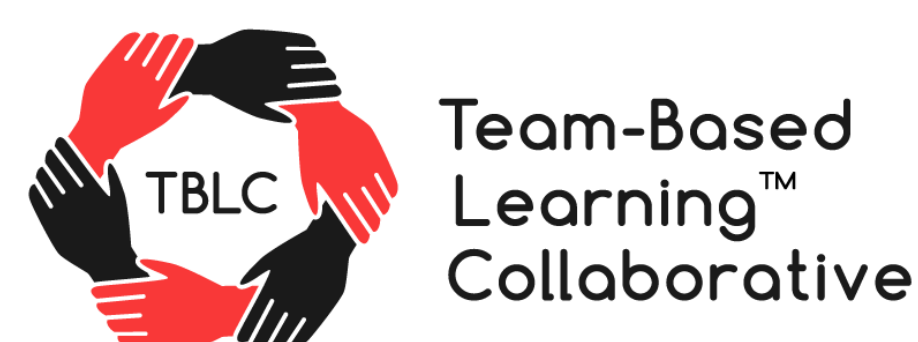
**Modality:** Face-to-Face assisted by ICTs  
**Training area:** BSc Mechanical Engineering  
**Course code:** IMEC 2520 Mechanics of Materials  
**Numbers of credits:** 3

#### Characteristics/essentials

- Mechanics of Materials is a compulsory second-year course for students in the Mechanical Engineering undergraduate program at Universidad de Los Andes.
- In this course, students learn the fundamentals for the design of elementary machine members in conditions of static equilibrium.
- Historically, traditional lecture-based instruction in this class results in an average passing rate of 50%, with about 30% students dropping the course, and 30% getting a marginal passing grade.

#### Transformation elements

##### Pedagogical



##### Technological



#### Lessons learned

Experience working with Team-based learning in this course has shown that much more work has to be done to raise awareness among students about the Importance of teamwork skills in school, work and life:

*"It is good that they make us work in teams, so that we learn to do it, but it makes no sense that they force us to learn in teams. Each person is responsible for his or her own learning. Yes, it is good that the team members can help each other, but this does not mean that my learning depends on the other, much less that my grade depends on the effort and/or learning of the other"*

A student feedback at the end of semester.

#### Effect and impact evidences

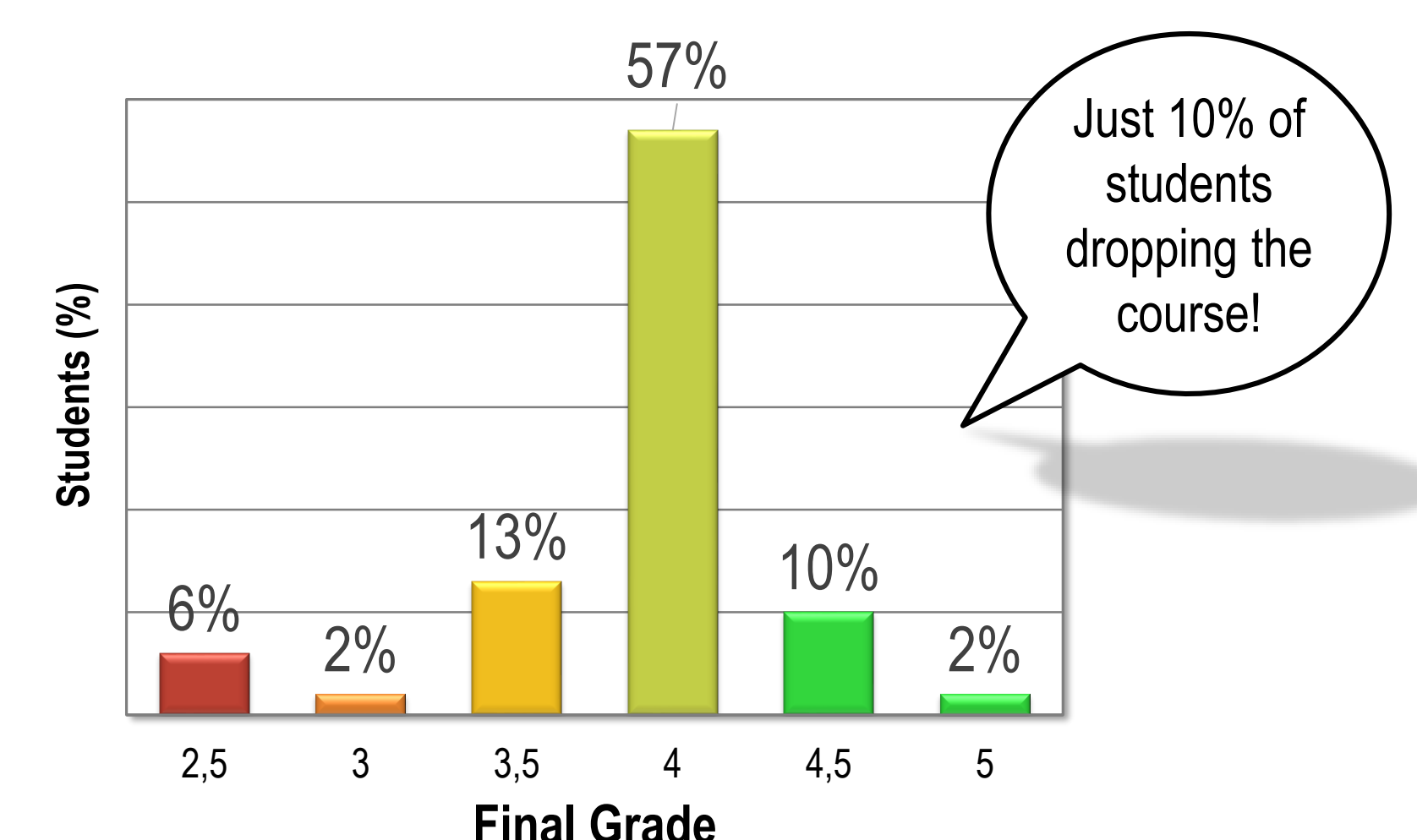
An engaging class experience for students and the instructor!



Students are the ones who use the boards!



Students learn in teams developing soft and leadership skills.



#### References

- [1] The Team-Based Learning Collaborative. 2018. "What is TBL?" Accessed June 21, 2018. <http://www.teambasedlearning.org/>.
- [2] West, M. A., & Markiewicz, L. (2008). Building team-based working: A practical guide to organizational transformation. John Wiley & Sons.
- [3] Michaelsen, L. K., Knight, A. B., & Fink, L. D. (Eds.). (2002). Team-based learning: A transformative use of small groups. Greenwood publishing group.