34th Annual Meeting

Monday – Friday, October 28 – November 1, 2019

Wyndham Grand Downtown Pittsburgh

Pittsburgh, Pennsylvania, USA

Conference Chair
Stephen J. Ludwick, Aerotech, Inc.

The student challenge rubric is intended to assess each team and their instrument in the areas of analysis, design, teamwork, presentation and measurement performance.

Our goal is to judge and provide feedback. Upon request, teams will be sent a list of parts that can be used.

Analysis & Design

Excluding figures you must submit a description (10 point font minimum, 1" margins all round and preferably less than two pages) of the measurement system. It should include an error budget and a description of the intended design.

Points awarded are based on the following:
- Presentation of design labeled diagrams to illustrate operating principles and assembly
- Error budget and design considerations
- Electro-mechanical control strategy

Teamwork

Points awarded are based on overall grade for assessment of team organization and execution.

Presentation and Measurement Performance

Each team will present their measurement system design and discuss their approach, considerations, and error budget. Time is extremely limited: 6 minutes presentations, 2 minutes questions and answers and 2 minutes for teams to setup/breakdown. Further discussions are encouraged in the 30 minutes for team demonstrations.

Each system entered in the ASPE Student Challenge will be rated according to a prescribed scale with the goal of quantifying system performance.

1. Measure five (5) samples
    a. Samples have a known (to the committee) mass between 100.000 grams and 400.000 grams. Note, these masses may be slightly magnetic.

b. The balance performance will be assessed for areas of accuracy, linearity, and repeatability over these measurements

c. Each sample will have an assigned value that will be determined ahead of time and not be revealed until after all measurements are gathered

2. Points awarded will be normalized for a reasonable range as follows:

a. **Accuracy** will have a maximum of 12 points for zero (0) bias from the assigned value to no points for yyy grams or greater.

b. **Repeatability** will have a maximum of 12 points for the average standard deviation of zero (0.00) to no points for a standard deviation of xxx grams and greater

c. **Linearity** will have a maximum of 6 points for the Pearson product-moment correlation (R^2) of 1.00 to no points for a value of 0.8 or lower

Rubric for judging ASPE student competition	Available Pts.
Analysis & Design (due 25 Sept.)	
Presentation	15
Design/error budget	15
Analysis/controls strategy/Signal Conditioning	10
Teamwork (evening of 28 October)	
Organization and execution	10
Presentation & Performance (midday 29 October)	
Presentation, clarity, explanation and team collaboration	10
Understanding and describing limitations	10
Accuracy, Linearity, Repeatability Testing	30
Total Available Points:	**100**

Student Challenge Organizing Committee

Luis A. Aguirre, 3M Company
Jose Carballo Boschetti, ASML
Raymond C. Cady, Corning
Leon Chao, NIST
Tim Dalrymple, Magic Leap
Mark Kosmowski, ESI
Steve Ludwick, Aerotech
Chuck Perry, Activesensetech
Stephan Schlamminger, NIST
Stuart T. Smith, University of North Carolina-Charlotte
Alex Sohn, Oculus