

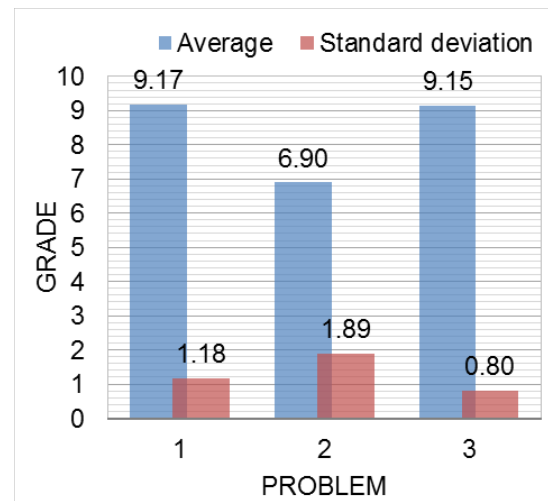
2015 Exam 1 – Report

General

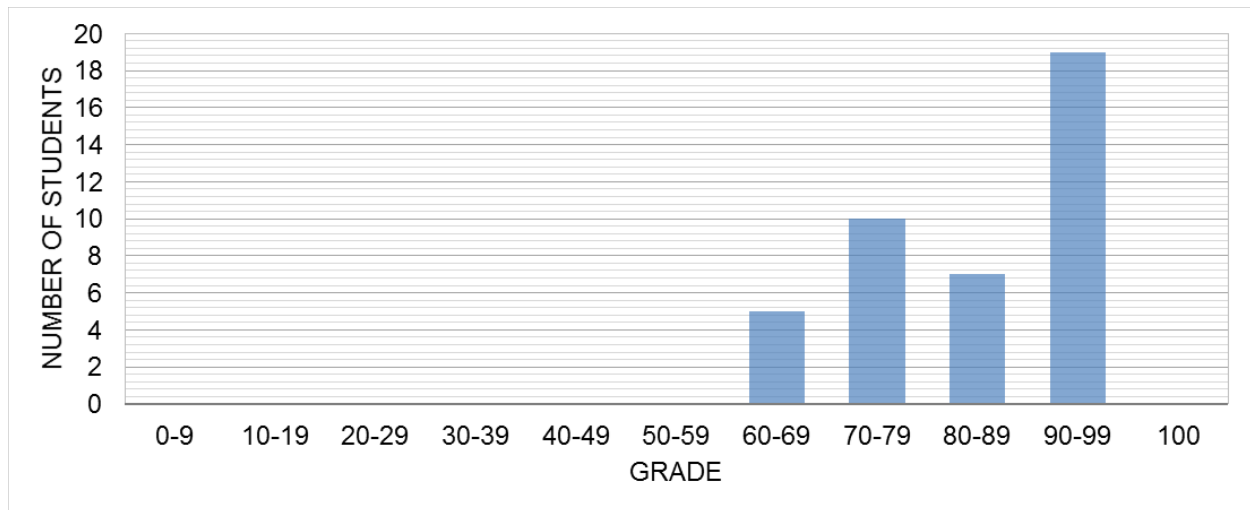
Total number of students	42
Attended	41
Missed	1
Number of problems	3
Average grade	84.07
Standard deviation of grades	10.11

Individual problem breakdown

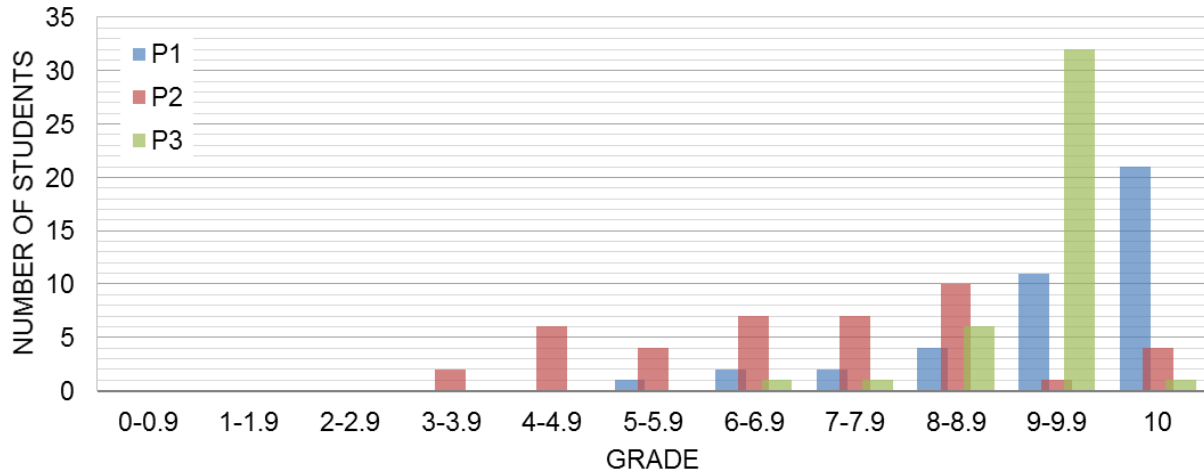
Problem	1	2	3
Average grade	9.17	6.90	9.15
Standard deviation of grades	1.18	1.89	0.80



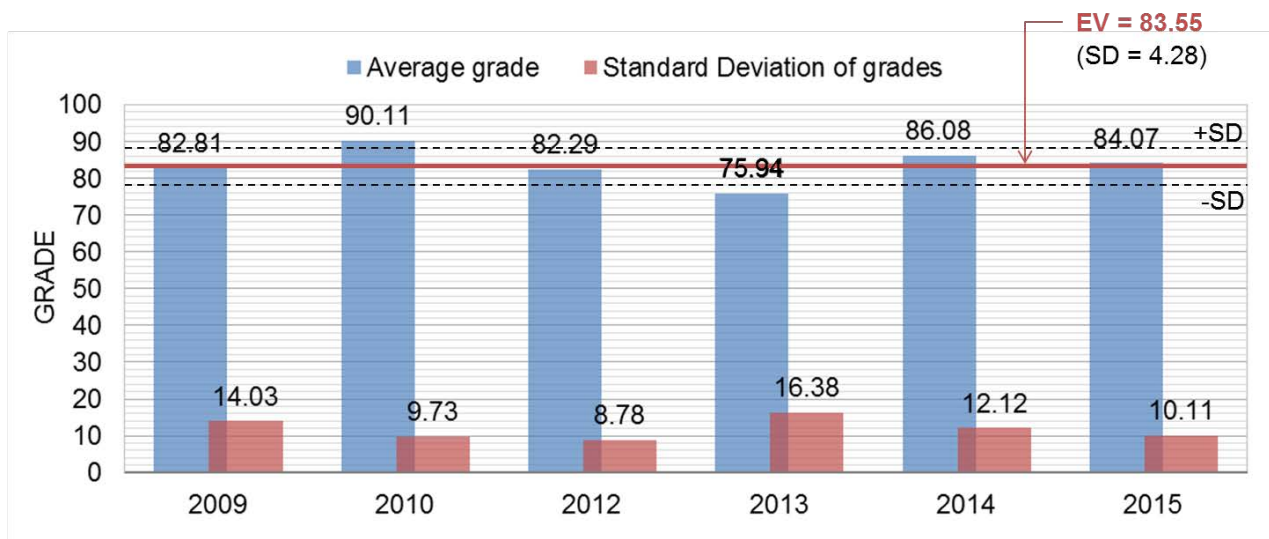
Grade distribution



Grade distribution per problem



Comparison with past years



Comments

OVERALL

- All students followed the rules for the formula sheet.

PROBLEM 1

- Some students did not assume the pressure at point 2 as gauge pressure. Instead, they calculated it by using $F=PA$ equation, which brought huge value for pressure at point 2. Therefore, the pressure at point 2 wasn't removed in the energy equation either.
- Few students forgot to include friction head loss.
- Few students did not find the velocity at point 2 by using momentum balance. Instead, they used the energy equation.
- Few students did not plug the velocity at point 2 into energy equation.
- Few students did not set the control volume from the outlet to the plate.
- Few students did not assume the height for point 1 as 'h'. Instead, they assumed either zero or radius of outlet.
- There were some minor mistakes, such as putting wrong sign, having no root when calculating velocity at point 2, or getting the area wrong.

PROBLEM 2

- x-momentum equation (part a):
 - Some students kept the gravity term even if there is no gravity action in the x direction.
 - Few students assumed the pressure gradient equal to zero.
 - Some students made calculation mistakes in integrating the equation and applying the boundary conditions.
- Maximum velocity location (part b):
 - Some students did not use $\frac{\partial u}{\partial y} = 0$ to locate the y_{max}
 - Some students assumed $y_{max} = h$ because the upper plate is moving while the lower one is fixed. This assumption is not correct since there is a pressure gradient acting and the velocity profile is not linear.
- Pressure difference (part c):
 - Some students used only the manometer fluid density instead of the difference between the density of flowing fluid and manometer fluid in the manometer equation.
 - Some student used $\frac{\partial P}{\partial x} = \Delta P$ instead of $\frac{\partial P}{\partial x} = \frac{\Delta P}{\Delta l}$
 - Many students used $\Delta P = p_1 - p_2$ instead of $\Delta P = p_2 - p_1$.

PROBLEM 3

- Most of the students did not realize that since there is only one P_i , the relationship is $\pi_1 = \text{constant}$.
- Some students made a mistake when finding the exponents.
- Some students tried to find 2 P_i 's instead of 1.

Quiz attendance

- [0 missed] 31 students attended 7/7 of quizzes and their average grade is 7.95.
- [1 missed] 8 students attended 6/7 of quizzes and their average grade is 7.18.
- [2 missed] 1 student attended 5/7 of quizzes and his average grade is 7.79.
- [3 missed] 1 student attended 4/7 of quizzes and his average grade is 5.75.

