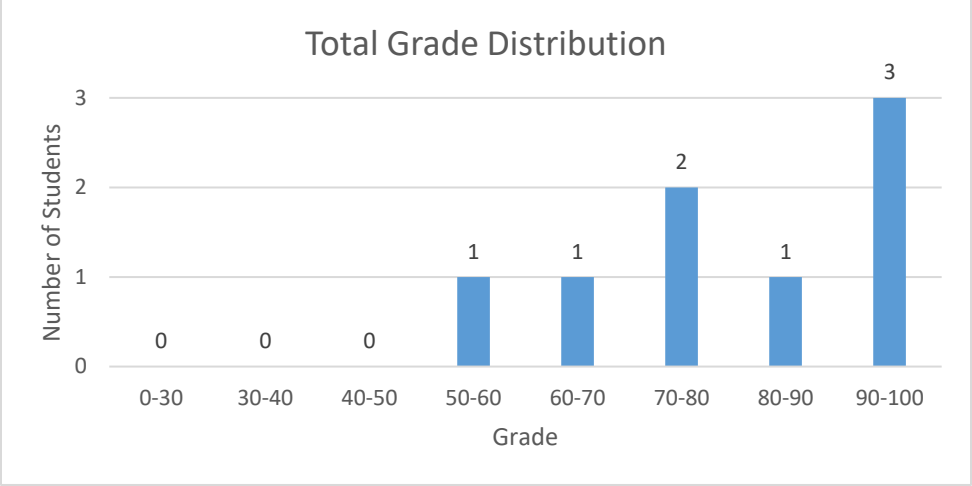
Final Exam Report

12/11/2023

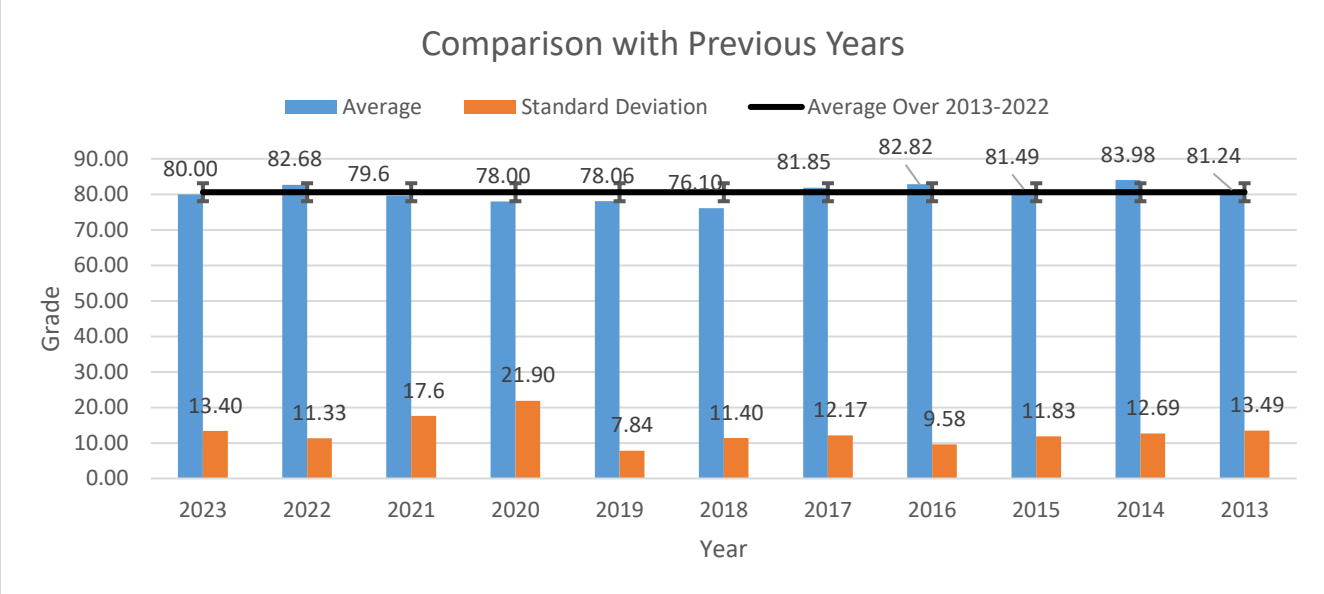
1. Summary

Total number of students	8
Attended	8
Missed	0
Number of problems	6
Average grade	80.00
Standard deviation of grades	13.40

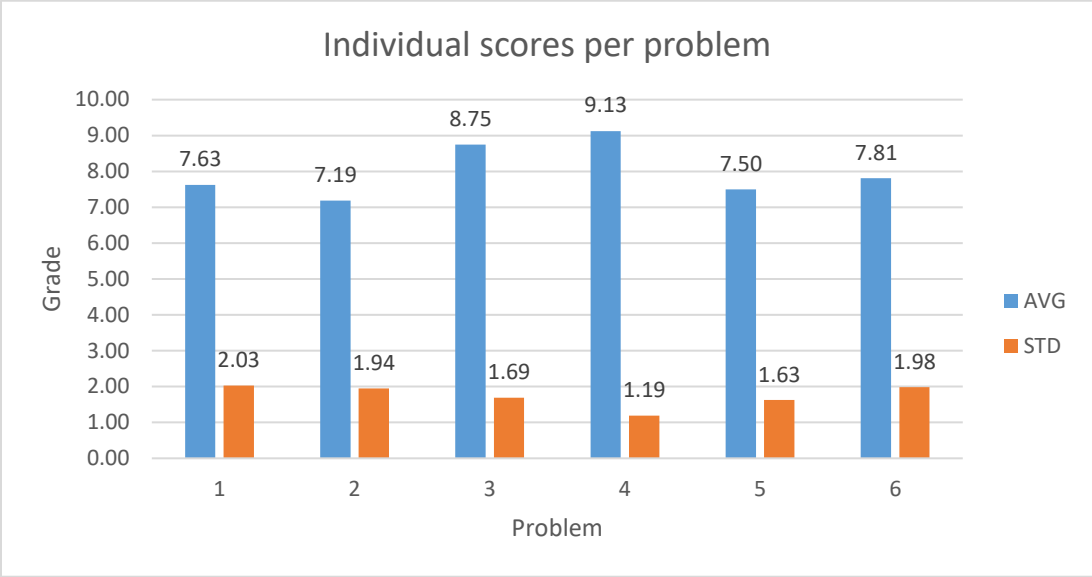
2. Grade distribution



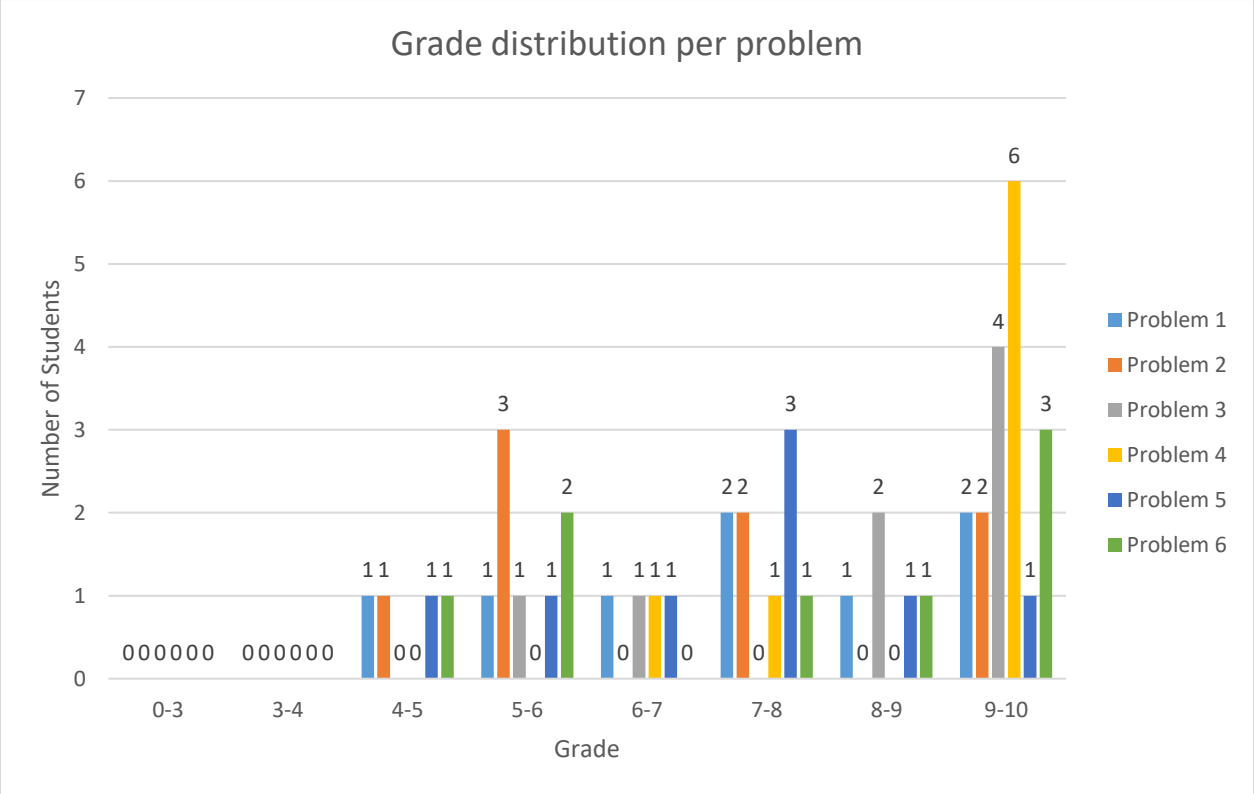
3. Comparison with past years



4. Individual problem breakdown



5. Grade distribution per problem



6. Comments

PROBLEM 1

- Two students received 100% points
- Four students setup the problem correctly and made mistakes in evaluating the integration terms or the extrema of the integrals
- Two students did not setup the integrals and did not use continuity and momentum equation correctly

PROBLEM 2

- Four students did not simplify the continuity equation correctly, obtaining $\frac{\partial v}{\partial y} = 0$
- Four students correctly simplified the momentum equation to obtain the ODE
- Two students obtained the λ's for the ODE and obtained the correct solution
- Three students applied the correct BCs to the velocity field

PROBLEM 3

- Only one student could not obtain the correct value of CD for the prototype parachute
- Most students solved the problem correctly, with minor mistakes
- One student could not apply similarity to get the velocity of the scaled parachute
- Some of students could not derive the appropriate formula to get the load weight that need to be added in the parachute

PROBLEM 4

- Most students solved the problem correctly, with 6 students having grades between 9.5 and 10
- One student used the Re obtained at L=40cm to evaluate the drag coefficient of the window, instead of using the full-length L=100cm.
- One student considered both sides of the window when calculating the drag force
- One student guessed $Re=10^6$ without using the dimensions of the window to evaluate the correct value

PROBLEM 5

- Only one student solved this problem correctly
- Most students obtained the relationship between V_1 and V_2, making mistakes in the calculations
- Four students imposed $h_{f_1} = h_{f_2}$ and tried to solve the equation iteratively for the two pipes
- One student could not impose the continuity equation and did not obtain $V_1 = f(V_2)$ or the velocities in the pipes

PROBLEM 6

- Three students solved the problem correctly
- Three students could not obtain the velocity field correctly from the stream function
- Two students did not consider both V_θ and V_r to evaluate the total velocity at point A as: $V = \sqrt{V_\theta^2 + V_r^2}$
- Most students wrote down Bernoulli's equation, but could not obtain the correct pressure at the specified point