

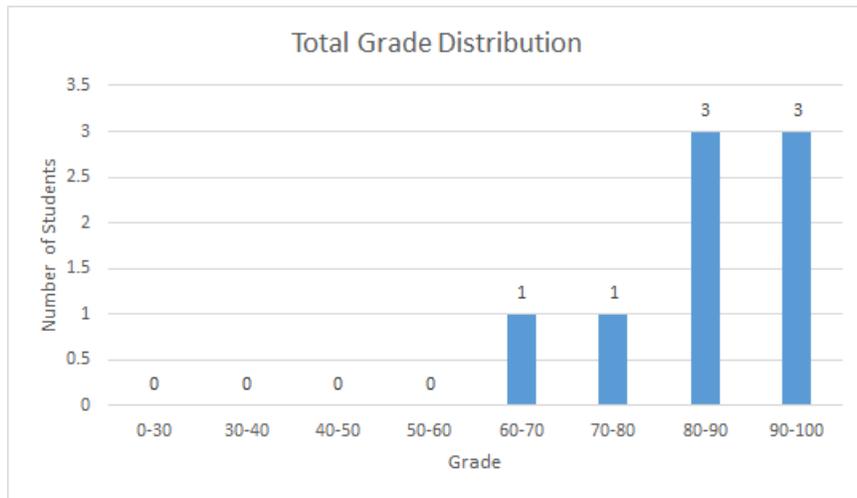
Exam 2 Report

11/10/2021

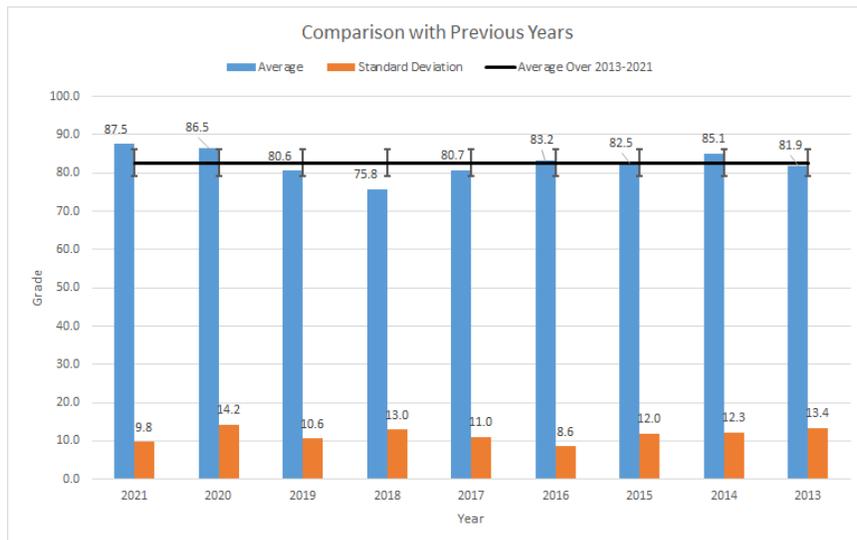
1. Summary

Total number of students	9
Attended	8
Missed	1
Number of problems	3
Average grade	87.50
Standard deviation of grades	9.76

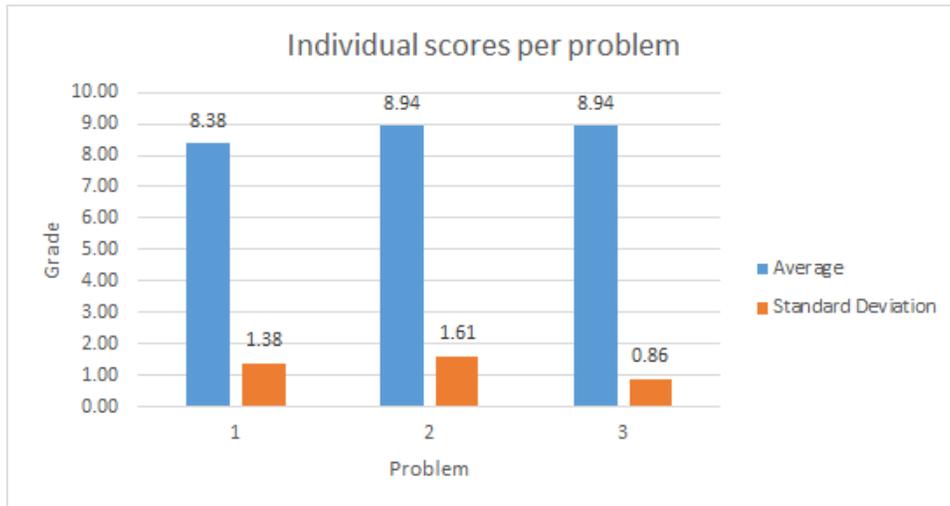
2. Grade distribution



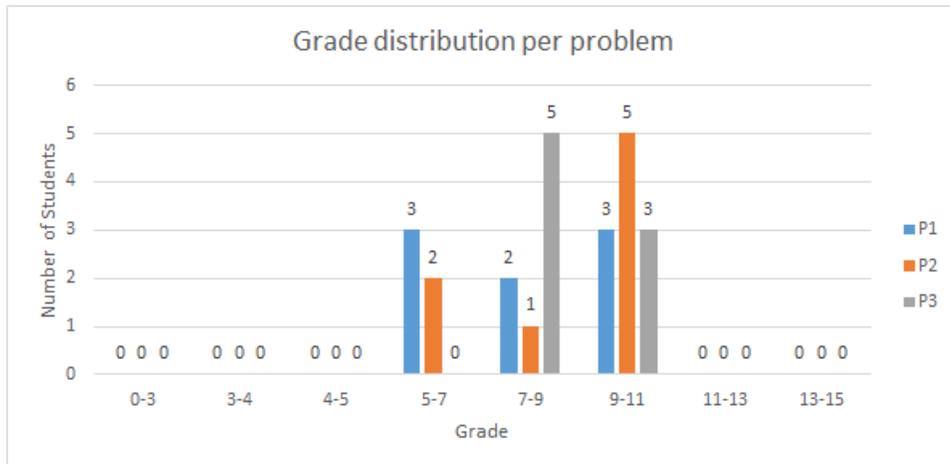
3. Comparison with past years



4. Individual problem breakdown



5. Grade distribution per problem



6. Comments

PROBLEM 1

- Three students simplified the Navier-Stokes equation correctly with the given assumptions then set up the correct boundary condition. They derived the velocity profile appropriately.
- One student derived the Navier-Stokes equation correctly but could not derive the integration constant C_1 and C_2 correctly.
- Some of student could not simplify the Navier-Stokes appropriately with the given assumption, and could not integrate the equation correctly.
- One student used wrong boundary condition at $r = R_2$

PROBLEM 2

- Many students solved very well and derived correct π_1 and π_2 .
- One student simply answered for π_1 and π_2 without any Pi theorem procedure
- It seems like that two students do not know how to approach to solve this kind of problem, and could not derive π_1 and π_2 and also couldn't answer for the drag force acting on a sphere

PROBLEM 3

- Several students missed the dynamic pressure term in energy equation
- Some of students used wrong Δz . It should have been considered together with pipe length
- One student simplified energy equation appropriately and set up the correct equation to use the Moody chart, but didn't try it and couldn't answer for the flow rate Q
- One student tried to use the Haaland equation rather than a Moody chart to get f , but he couldn't answer for the flow rate Q