

ECEN 667 Homework 7 (Fall 2023)

Does Not Need to be Turned In, But Should be Done Before the Second Exam

1. Book 8.8
2. In the **HW7_2023_Prob2** case the generator 2 exciter Ka value has been modified to give an unstable response. Using the SMIB tool, plot the eigenvalues with positive real parts as the value of Ka is decreased. Give several points in your plot. At what value does SMIB indicate the system becomes stable? Be sure to **Re-Initialize** the case between each SMIB solution with different parameters. How closely does the response expected from the SMIB match the actual system response? Comment on why they might be different.
3. The case **HW7_2023_Prob3** case models a four bus, four generator system with GENROU models. Using the tool or method of your choice, determine the frequency and damping for the key bus frequency modes. Analyze the data from 0.1 to 5 seconds, and you can ignore modes with frequencies below 0.2 Hz. To provide each student with a customized result, change the H value for the i^{th} generator to equal the i^{th} **last** digit in your student ID (where i goes from 1 to 4 so $i=1$ is the last digit); treat a zero as 10.
4. Using the **WSCC_9Bus_Stab** case from class first use the same procedure from problem 4 to customize the problem by changing the inertia of the generators based on the last three digits in your student ID. Then repeat the tuning procedure presented in class for a PSS1A stabilizer at the one of the generators (your choice which one!). Assume there are no stabilizers at the other two generators.