MAS410 – Main project, Supervisor Guidance

The main targets of the project are as follows:

- Design a hydraulic system by choosing components from commercially available components: motor, servo valve, hydraulic power unit, and, optionally, adding a brake valve,
- develop a controller (control scheme/control strategy) so that the heave compensation of the draw work can be carried out,
- develop a time domain simulation model of the hydraulic-mechanical system in Matlab/Simulink/Simscape,
- use the simulation model to verify the performance of the hydraulic system and the controller,
- use the simulation model to simulate are failure of some kind, and
- document the work in a report of a maximum of 15 pages.

The quality of the project is based on whether the students manage to set up model(s) that reflect the dynamics of the hydraulic-mechanical system and manages to control the payload motion so that it is properly heave compensated. This includes implementing a control structure with computation of reference behavior and feedback and/or feedforward loops and using the data supplied in the project description correctly.

The main project should reflect a good understanding of the physical principles behind the hydraulic-mechanical system, the control scheme, the state variables of the model(s), and the influence of the choice of components on the behavior of the overall system.

The main project should also reflect the ability of the students to use modeling and simulation as a tool in design (in this case the hydraulic system) and understand the limitations and possibilities of a commercial software like Matlab/Simulink/Simscape.

There are no guidelines for the content of the report, only that it should be less than or equal to 15 pages (appendices allowed). The main purpose of the report is to demonstrate the work done by the students and the results of the project in a clear way.

Otherwise, it is recommended to read the project description carefully since it gives a clear indication of the amount of available modeling data and therefore, implicitly, the expected model complexity.