

# smg296

## Stephen Galdi's Individual Contribution Page

### Spring 2015 Contributions

In the Spring 2015 Semester I worked on the Fabrication Team to evaluate the model StaRS flow control system. The weir control system was scaled and largely fabricated in Fall 2014, and I helped to set up the system so that it can accurately demonstrate the theory behind its design. Demonstration videos and gif files were uploaded to the Team Drive as well as to the Fabrication Team Wiki Page as part of the final presentation and report.

### Spring 2016 Contributions

In the Spring of 2016 I returned to AguaClara to work with the High Rate UASB Team after taking CEE 4540 in the fall to learn more about AguaClara technology and design methods. The main objectives of the High Rate UASB Team (later renamed the Expanded Granular Sludge Bed or EGSB Team) were to design and fabricate a fluidized UASB reactor and fine tune it in order to maximize the difference between the hydraulic and solids retention times. After conducting a literature review of anaerobic sewage treatment applications, high rate anaerobic reactors (largely EGSBs), and bench-scale anaerobic granule experiments I helped advise the team on selecting design parameters. By the middle of the semester I had helped to build four 2 meter tall reactor modules, which were inoculated after determining the mean inoculation granule diameter (2mm) and mean minimum fluidization velocity (~1.7 mm/s). After inoculation, I worked with Paul in the CEE Lab as well the rest of the EGSB team to solder the wiring for four new methane sensors. After connecting the methane sensors I conducted further literature reviews and reactor modifications in response to the ongoing headloss, granule blockage, and acidification problems. As the semester came to a close I helped conduct a COD test of each reactor's effluent as well as a granule size characterization, which determined that COD removal efficiency was fluctuating between ~40-80% and the granule sizes were decreasing in the first and final reactors. The full collection of data and figures from these experiments are posted in the Research Team Drive Folder, with the major results, discussion, conclusions, and recommendations elaborated in the semester final report.