

## Senior Design Project Description

<b>Company Name</b>	<i>Electrolux</i>	<b>Date Submitted</b>	<i>10/30/2020</i>
<b>Project Title</b>	<i>Design of Water Reclamation System for Fabric Care Reliability Lab</i>  (ELEC_FABRIC)	<b>Planned Starting Semester</b>	Spring 2021

### Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills:

<b>Discipline</b>	<b>Number</b>	<b>Discipline</b>	<b>Number</b>
Mechanical	2	Electrical	1
Computer		Systems	1
Other (civil engineering - environmental)	1		

### Company and Project Overview:

Electrolux shapes living for the better by reinventing taste, care and wellbeing experiences, making life more enjoyable and sustainable for millions of people.

As a leading global appliance company, we place the consumer at the heart of everything we do. Through our brands, including Electrolux, AEG, Anova, Frigidaire, Westinghouse and Zanussi, we sell more than 60 million household and professional products in more than 150 markets every year.

Electrolux has been doing business since 1919. The global headquarters are in Stockholm, Sweden and its North American headquarters are in Charlotte, NC. The following products are sold in North America under the Electrolux and Frigidaire brand.



UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE of ENGINEERING



### **Project Context:**

Electrolux has a strong commitment to improving the environment. The Fabric Care lab has identified an opportunity to reduce our water consumption inside the reliability lab by re-using grey water we currently discharge to the sewer.

The reliability lab is capable of continuously running up to 50 washers which can consume up to 156,000 gallons per year. We would like to re-use 50% of the water currently discharged to the sewer (~78,000 gallons). This project would require designing a plumbing system to reclaim a portion of the grey water by using a recirculation loop with the capability to filter and clean the water for re-use.



Photo of reliability test stations

### **Project Requirements:**

The project requires designing and prototyping a water reclamation system which can save a minimum of 50% of the total water used in the reliability lab.

The first steps of the project are to identify with accuracy the current total water consumption per week, water quality of grey water and to fully understand the existing plumbing system. Then the team will need to produce concepts which could achieve a 50% water savings. This will entail designing a plumbing system which can capture the grey water and then treat it to provide a fresh supply back to the washers on test. After the concept is selected, a small-scale prototype will be



UNC CHARLOTTE

*The WILLIAM STATES LEE COLLEGE of ENGINEERING*

needed to demonstrate feasibility.

**Expected Deliverables/Results:**

- Plumbing design drawings
- Selection of equipment (pumps, heaters, chillers, filters, etc)
- Small-scale prototype
- Cost estimation
- Test data demonstrating reclaimed water supplied to washers meet the following specifications:
  - Pressure: 40 – 60 psi
  - Cold temperature: 50 - 60 F
  - Hot temperature: 110 – 120 F
  - Total water hardness: 20 – 40 ppm

**Disposition of Deliverables at the End of the Project:**

The prototype, test fixtures and all intellectual property will be delivered to Electrolux at the completion of the project.

**List here any specific skills, requirements, specific courses, knowledge needed or suggested (If none please state none):**

- Water Treatment & Water Quality
- Fluid Dynamics
- Controls