UNC CHARLOTTE
The WILLIAM STATES LEE COLLEGE of ENGINEERING
Industrial Solutions Laboratory

Company Information

Company Name	*Carrier Corporation*	**Date Submitted**	*05/04/2021*
Project Title	*Design Automation to support Commercial HVAC Chiller Products* **(CARR_AUTO)**	**Planned Starting Semester**	*Fall 2021*

Senior Design Project Description

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:

Discipline	Number	Discipline	Number
Mechanical	3	Electrical	0
Computer	2	Systems	0
Other ( )	0		

Company and Project Overview:

Carrier's Charlotte division is focused on large scale chiller solutions that support building AC systems. This entails two major product lines; Applied and Packaged Chillers that both apply technology centered around the vapor compression cycle. Packaged chillers are typically outdoor applications and smaller in cooling capacity than applied chillers that typically reside in a building's mechanical room.

Project Requirements:

The senior design team will be responsible for developing, testing, and deploying 4-6 programs to expedite design work for the above described chiller products. The senior design team will maintain a Microsoft Project schedule detailing and tracking current status of each program throughout the course of the project.

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The base coding language for the programs to be written in is Sigmaxim's SmartAssembly.

Sigmaxim is a company that makes add-on tools for Creo. SIGMAXIM customizable Task-Specific Apps automate specific complex functions in the design/development process to save time and ensure accurate results. Every company has its own carefully developed list of Best Practices. SIGMAXIM integrates a company's BEST Practices into Creo. As designers work, best practices are automatically implemented into the design (if there is conflict the user is notified). This ensures that either all the designers follow Company Design Rules and Best Practices, or that the user is aware that there is an exception to the rules.

SmartAssembly for Creo is one of the products Sigmaxim makes for Creo. You can learn more about Smart Assembly here:
https://www.sigmaxim.com/index.php/products/configuration-tools/smart-assembly

The programs will vary in size and scope to some degree and the exact projects to be done will be chosen prior to the semester beginning in August of 2021. The team will work collaboratively with Carrier's engineers to be sure that for the programs chosen the design rules are properly implemented. Students would be expected to attend a 2-3 day workshop such that Carrier Employees would be able to introduce them to the SmartAssembly software in which they would be coding.

Expected Deliverables/Results:

Separate deliverable documents will be provided outlining requirements once programs have been chosen.

Disposition of Deliverables at the End of the Project:

Software developed as part of this project is property of Carrier Corporation. Students will either be given access to the appropriate location to deploy the software or a means of file transfer will be established in the initial stages of the project. Towards the end of the project user testing will require the software to be uploaded on Carrier servers and will also serve as the means through which the students deliver their work.

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

- Creo
- Student team is required to learn and become proficient in the Smart Assembly software. Team to work out logistics with Carrier how and when to conduct training. Smart Assembly software licenses have been secured and are located on the Mosaic computers in the CAB lab.
- Pro-Piping (desired but not required)
- Sheetmetal Design (desired but not required)
- UDF creation within Creo (desired but not required)
- Windchill or PLM knowledge (desired but not required)
- Some level of coding experience
- Excel
- Advanced CAD/CAM elective (desired but not required)
- Process Flow Mapping (examples usually done in Microsoft Visio)
- Microsoft Project

- Vector Math