**ECE 3822: Software Tools FOr eNGINEERS**

# HOMEWORK No. 4: Command Line Compilation

The goal of this homework is to demonstrate how to compile and link a program. We will use C/C++ for this exercise.

The tasks are:

1. Create a function called ece\_3822\_add\_sin that takes two floating-point values as arguments and returns the sum of the sin of each value (using the sin function in math.h). Save it to a file called f\_01.cc.
2. Create a main program that prints “hello world,” calls ece\_3822\_add\_sin, and prints the result. Save this to a file called f\_00.cc.
3. Compile and link these files into an executable called hw\_03.exe using -O2 optimization. Run it and demonstrate it gives the proper result.
4. Create a makefile and demonstrate that you can compile and link the program using a makefile.
5. Repeat this but compile using the debug flag so that you can run this code in a debugger.
6. Now create a library containing ece\_3822\_add\_sin. Use the ar command. Google search to learn how to use this command.
7. Compile and link your program using this library instead of linking the object file directly.
8. Compile your program using the compiler option that generates assembly code (e.g., “-S” on most of your machines). View the assembly code and explain how it matches the source code.

Later in the semester we will replace all this with an integrated development environment that automates many of these details. The goal of this homework assignment is to give you some idea of how things work behind the scenes.