**MCET 530 – THERMAL FLUIDS SCIENCESS II**

**PROJECT PROGRESS REPORT**

**DUE: Monday, March 25, 2019**

**COMPANY NAME:**

**OBJECTIVE**

Using all available resources, design and analyze a power plant that operates on an *actual* modified *vapor power cycle*. The main objective of this task is to maximize the power output from the plant, while minimizing cost.

**REQUIRED DELIVERABLES:**

The first component of your progress report should be a detailed **thermodynamic analysis** of the designed plant. Your analysis must include solutions for the following:

1. Net heat transfer into the cycle
2. Net heat transfer out of the cycle
3. Net power output of the cycle (net work)
4. Cycle efficiency, ηcycle
5. Overall plant efficiency, ηplant
6. Mass flow rate of the fuel

Remember, your plant design is limited to the devices available for purchase. All devices vary in cost, efficiency, and maximum operating parameters. Your design must consist of at least a boiler, turbine, condenser, pump, electric generator, a source for Qin (combustor, reactor, or solar receiver), and a cooling system. However, you may deviate from these basic components and include creative modifications to enhance cycle performance.

In addition to a thermodynamic analysis, you must also consider the **purchase and operational costs** compared to the efficiency. You must provide a yearly operating budget that contains the following information:

1. Initial company capital
2. All device names and prices used in the plant
3. Total cost of all components in the plant
4. Cost of the fuel, per year
5. Environmental fines from both the fuel source and cooling system, per year
6. Final operating cost and gained revenue for one year operation (include initial cost)

**APPROVAL SIGNATURES:**

Project Manager \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_

Customer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_