

## **1.1 Project Scope**

### **Project Description**

- Portable hydroelectric generator for personal and commercial use.

The initial goal is to develop a proof of concept based on the idea of a portable hydroelectric generator. This proof of concept will demonstrate a modular alternator-based electrical system that will be mechanically powered by means of a rotating water wheel and helical turbine in two different variations of a mechanical framework.

### **Key Goals**

- Environmentally friendly/sustainable, Scalable, Affordability, Reliability, Versatility

One of our primary goals is to create a renewable energy generation device that has a low environmental impact. Building upon this primary goal, we want to create an energy generation device that can be efficiently scaled up to meet a variety of electrical demands. While building towards these goals, a key consideration will include developing a cost-efficient design that has a high degree of reliability and versatility.

### **Primary Market**

- Low-power infrastructure zones; Third-world countries, rural areas.

The primary market being targeted by the intended design are areas with low-power infrastructure. The intended meaning of low-power infrastructure zones is an area that has little to no infrastructure for power generation whether commercial or individual. Examples of these low-power infrastructures zones were then considered to be third-world countries and rural, isolated areas. A prerequisite for these areas to be considered would be to have a moving water source such as tidal, rivers, streams.

## **Secondary Market**

- Emergency power generation, personal power generation.

The secondary market being targeted with the intended design would be in emergency power generation/individual power generation. Meaning this device would be able to function independently as an emergency source of power production when the main electric grid can't deliver power to a location due to natural disasters, accidents, etc. In coastal areas or areas with a flowing water source this device could be used for individual means. Using the device as a source of power generation for residential or commercial properties.

## **Assumptions**

- All components of the system can be purchased within the budget.

To ensure the completion of a prototype by the end of the second semester of senior design the components necessary to be purchased can't exceed the budget. Ideally each component of a typical generator would be purchased unless the component could be machined independently, cheaper, and in a time sufficient manner.

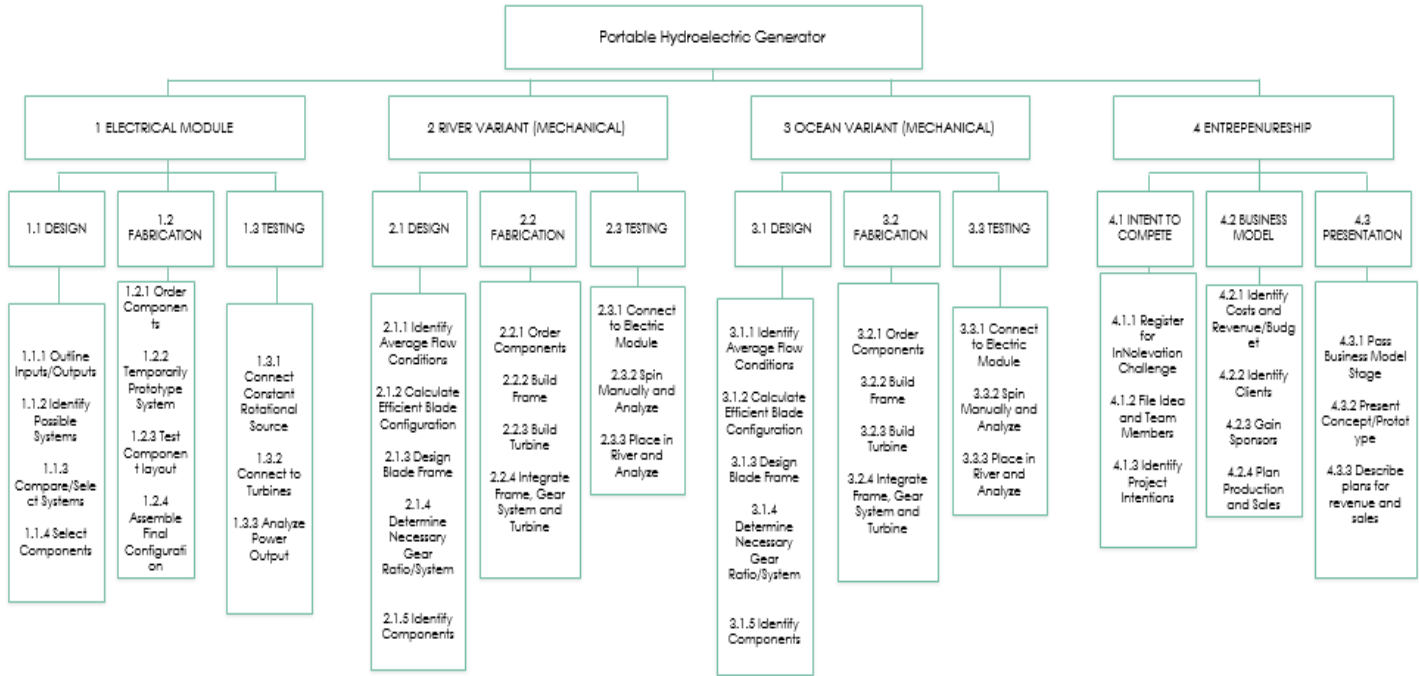
## **Stakeholders**

- Dr. Devine

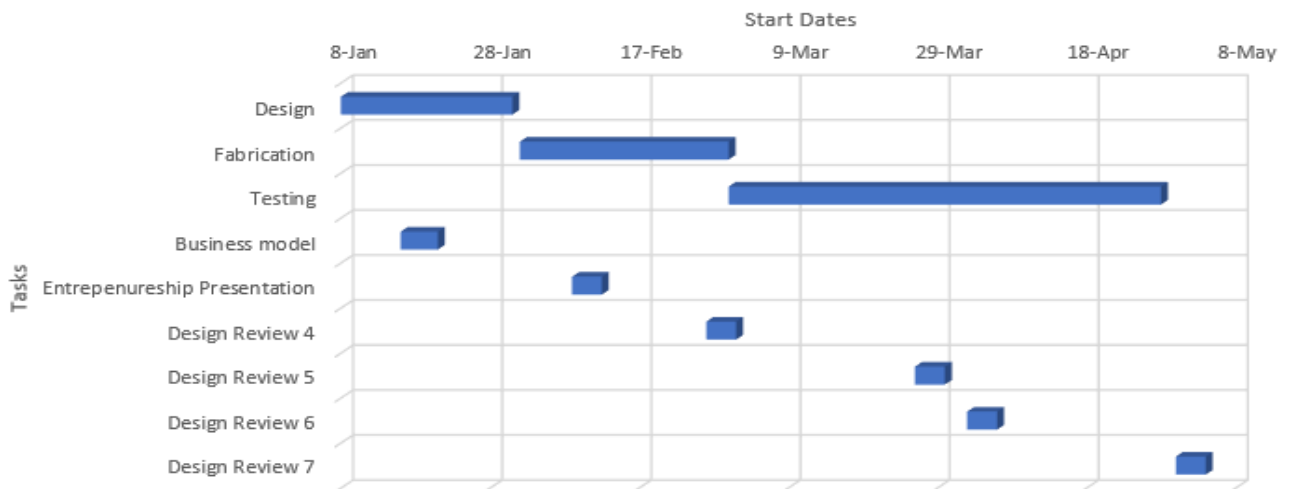
The stake holder in this project is Dr. Devine as the lead for the entrepreneurial based projects, the budget will be provided by the FAMU-FSU College of Engineering. Although being an entrepreneurial project the beneficiaries of the project include each of the four members on the team and divided equally among them as established by the Code of Conduct.

# Work Breakdown Structure

<b>PROJECT TITLE</b>	Portable Hydroelectric Generator	<b>COMPANY NAME</b>	Flo-Ration
<b>TEAM NUMBER</b>	13	<b>DATE</b>	29NOVEMBER2017



## Gantt Chart



## **Task Ownership**

1. Web Design – Colin & Taylor
2. River-Variant CAD Model – Jackson
3. Ocean-Variant CAD Modal – Taylor
4. Electrical System Configuration – Taylor & Colin
5. InNOLEvation Requirements – Team Collective
6. River-Variant Fabrication – Lawson & Jackson
7. Ocean-Variant Fabrication – Taylor
8. Testing – Team Collective
9. VDR presentations and other project documentation – Team Collective

## **Budget**

### River-Variant (Mechanical Component)

- + Lumber/Hardware [\$15 USD]
- + Rectangular Tube (Al) [\$230 USD]
- + Shaft (SS) [\$25 USD]
- + Round Tube (Al) [\$20 USD]
- + Bearings [\$60 USD]
- + Crank Gear [\$25 USD]
- + Gear Cassette [\$15 USD]
- + Chain [\$10 USD]
- + Bungee [\$20 USD]

### Ocean-Variant (Mechanical Component)

- + Hardware [\$15]
- + 3D printer filament [\$0.053 USD per gram]
- + Coupler [\$3.65]

### Electrical System Components

- + Low-Wind Permanent Magnet Alternator [~\$219] (Built in Rectifier)
- + Charge Controller [\$44]
- + DC-AC Power Inverter [\$16.39]
- + Miscellaneous [\$~20]
  - Wires
  - Extension Cord

Grand Total: [~\$768.04 USD]