**Request Form for Senior Design Project Proposal
Drs. Miguel Gonzalez & Javier Macossay-Torres
July 15, 2015
Rev A**

* **Project Title: Design & Development of Additive Manufacturing Processes for Biodegradable Materials**
* **Is the project CONFIDENTIAL? Yes / No**
* **Pl. identify critical Design Component(s)?**

**Selection matrix for AM & potential biodegradable materials including shape & size
Evaluate feasibility
Demonstrate feasibility**

* **Expertize needed to address the design component (pl. circle ALL that apply)**

**Statics, Dynamics, Thermo, Fluids, Controls, K&D, Heat Transfer, Materials, FEA, …..**

**Pl. add anything else you feel needed. Thanks. Machine Design**

* **Special software expertise needed?**

**Matlab, LabView, Algor, Solidworks, …..**

**Pl. specify if there’s anything else? Thanks.**

**No**

* **Is Machine shop expertize needed? Yes / No**
* **Pl. mention MINIMUM Measurable Outcome(s):**

**Identify characteristics of biodegradable materials amenable to Additive Manufacturing (AM)**

**Develop process parameters for AM specifically for these biodegradable materials**

**Demonstrate feasibility and/or identify key obstacles to overcome**

* **Is there any Key Performance Indicator (KPI) you plan to use to measure progress towards Measurable Outcome?**

**Develop screening matrix for AM & identify class of biodegradable materials
identify potential candidates based on this matrix & selection criteria
Identify shape, size, and form of biodegradable materials for AM
Demonstrate feasibility of AM for at least three different materials**

* **Brief Description:**

**3D printing has become as popular as computers. This is just one of many ways to make a part using the method called Additive Manufacturing (AM). Unlike conventional manufacturing, materials are not subtracted from a piece/stock to make a part. Expectedly, it has many advantages like no waste. AM has been successfully used in many applications like ornaments, parts in the field, parts difficult to impossible to make in conventional manufacturing method due to geometric complexity, etc. However, one of the major limitations of AM is the choice of materials. Many polymers have been successfully used in AM in commercial applications. However, use of metals needs expensive equipment. Other limitations are the resolution and precision. In this project we will explore the characteristics a material needs to have to be successfully used in a specific AM technique. Combining this with the process parameters of the chosen AM technique, you will identify a number biodegradable material suitable for AM. Opportunities are endless. One day, we might be able build tooth, bones, hearts, etc., at will, using the methodology you are going to develop in this project.**

**Note: Mr. Ivan Villarreal is already enlisted for the project. We need two more students!**