UNC CHARLOTTE
The WILLIAM STATES LEE COLLEGE *of* ENGINEERING

Senior Design Project Description for SPRING 2016
Project Title: Bioceramic as Drug Delivery System

Supporter: UNC Charlotte MEES
Supporter Technical Representative: ASSIGNED
Faculty Mentor: __X__ ASSIGNED _____ TBD (check one)
Single Team __X__ Dual Team _____ (check one)
Personnel (EN/ET): _____ E, _____ Cp, _____ Cv, __1__ M, _____ SE
(Complete if the number of students required is known)
Expected person-hours: (250 per student)

Description of Project:

Significant research efforts are directed to use bioceramic as drug delivery system. The objective of this project is to analyze the efficacy of injectable bioceramic on drug delivery. Bioceramic particles will be suspended in biocompatible gel and injected through a needle. The efficacy of the injectability will be measured against the percentage of actual ceramic mass that passes through the needle.

Initial Project Requirements (e.g. weight, size, etc.):

Three different ceramics will be compared in terms of: ability to bind anticancer drug, the drug release kinetics in physiological solution and drug retention. The concentration of the released drug will be determined by Inductively Coupled Plasma-Optical Emission Spectrometry (ICP-OES) and High Performance Liquid Chromatography (HPLC). The student will learn how to prepare injectable bioceramic drug delivery system and evaluate its efficacy in vitro.

Side objectives of the project are:

1. Preparation of biocompatible gel
2. Determination of mass loss during injection
3. Preparation of standard solution for drug concentration measurements
4. Measurements of the drug concentration using ICP-OES and HPLC

Expected Deliverables/Results:

The deliverable will be a functional prototype. A report showing the results of all the measurements and tests is required.

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

Student must be MEES student with Bio concentration