# Bachelor of Science in **Biomedical Engineering**

Prof. Matthew Leineweber

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August 15, 2019

# WELCOME

- Welcome!
- Welcome!!
- Welcome!!!

*Please feel free to stop me and ask questions at any time*

# Do you know the way to San José?

- **Location:** Heart of Silicon Valley
- **Population:** 1 million – 10th largest city in the US
- **Climate:** Best in the world *(practically)*
- **Diversity**: Outstanding
- **Technology** The most vibrant place on earth
- *More than 1100* ***biomedical companies*** *in the Bay Area*
  - Large, medium, & start-ups
  - >600 companies in manufacturing

- **Beach**: 45 minutes away
- **Mountains**: 30 minutes away
- **Original Song:** *Do You Know the Way to San José?*

  *by Dionne Warwick*

# University Structure

- **7 Colleges**
  - Each college has its own *departments*
  - Each department has its own degree programs

- **College of Engineering**
  - 10 Departments
    - BME is the newest!
  - 13 Degree Programs
    - Department = administrative unit
    - Program = academic discipline in which degree is awarded
    - Some departments contain multiple degree programs
      - *e.g. Chemical & Materials Engr. Department*

# BS in Biomedical Engineering

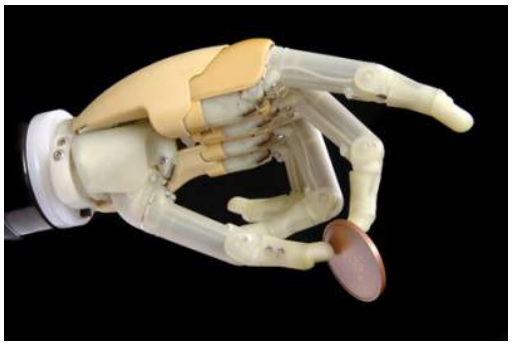
- Degree approved by chancellor in October 2011
- ABET accredited in October 2014
- Became an Independent ***Biomedical Engr. Department*** on July 1, 2018
- Offices: Room 233, Engr. Building

# Changing your major to BME

- If you are currently admitted to or pursuing other majors (including Undeclared):
  - **Submit** the *Apply for Change of Major* form to a biomedical engineering advisor
    - Less than 90 units
    - More than 90 units
  - **Complete Study Plan**: 9-10 units of science, math, and engineering in one semester at SJSU
    - GPA > 2.7 with no individual grade lower than a C
    - Study plan is determined and filled out by a BME Advisor

# What is Biomedical Engineering?

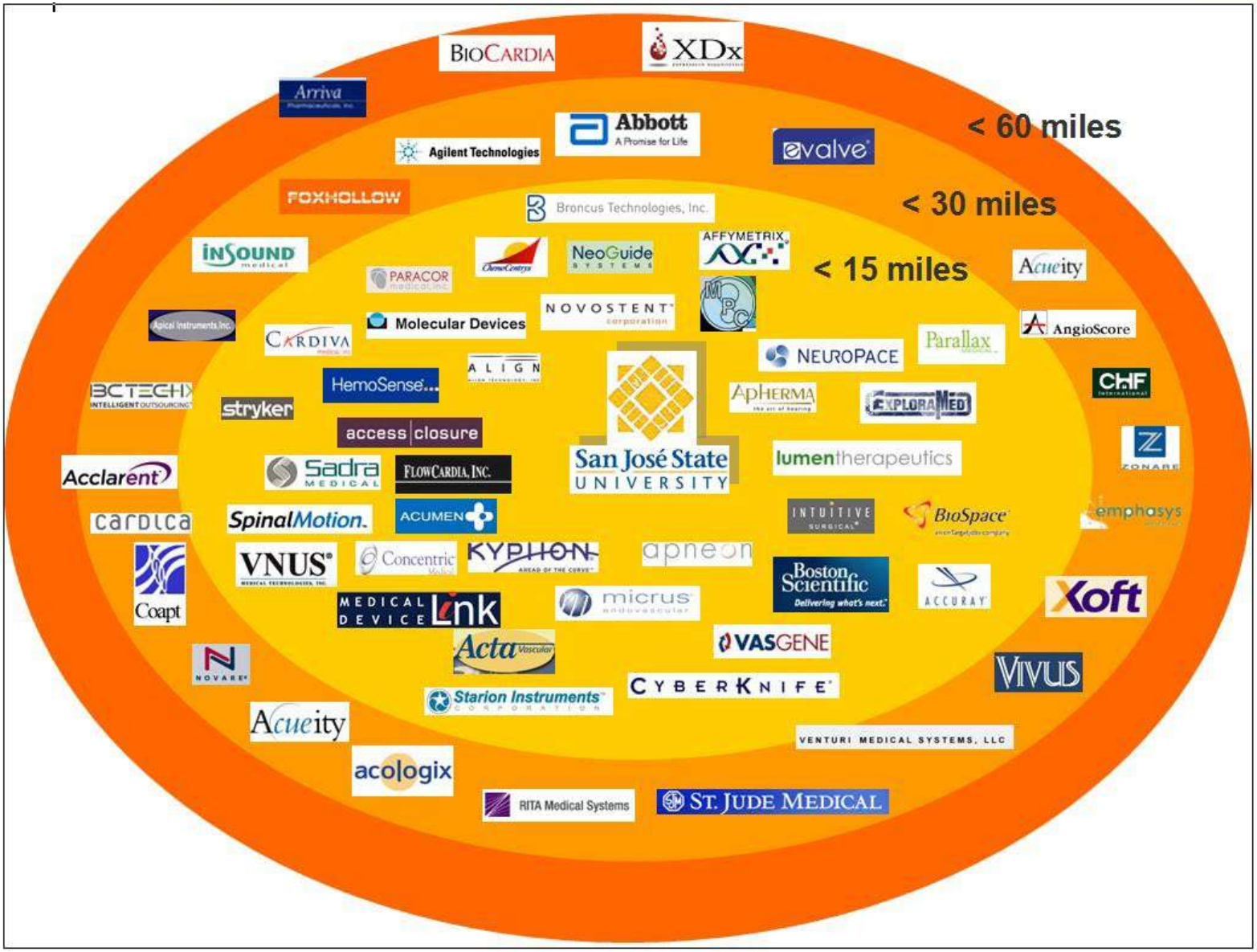
- Application of engineering knowledge to the biological and health sciences for the improvement of quality of human life.
- Interdisciplinary
- Rapidly growing field
  - Opportunities for innovation, entrepreneurship, collaboration, and jobs
- Requires the ability to communicate with life sciences, professionals, physicians, regulatory affairs, and others
- **FDA-regulated industry**



# Disciplines/Areas within Biomedical Engineering

- Biomedical devices
- Biomechanics
- Prosthetics, orthopedics
- Informatics
- Biopharma
- Imaging
- Tissue engineering
- Diagnostics
- Proteomics, genomics
- Biomaterials
- Microfluidics
- Signal processing
- Nanotechnology
- Quality
- Regulatory

And many others, including some that are evolving




*SJSU Biomedical Engineering*
*August 15, 2019*

This figure compiled by Ganesh Iyer

# Biomed. Engr. in California – By the Numbers

| | |
|---|---|
| **Number of biomedical companies** | **3,249** |
| **Medical Device, equipment mfg** | **1,796** |
| Revenues | $169B |
| Direct Employment | 298,709 |
| In medical devices, instruments, and diagnostics | 77,278 (26%) |
| In the Bay Area (#1 in California) | 77,663 (24%) |
| Indirect/Induced Employment | 621,000 |
| Total Employment | 919,709 |
| Employment growth rate (2012-2016) | 7.7% |
| Venture capital investment | $6.7B |

Source: California Life Sciences Industry Report 2018 Report

# Driving forces behind the numbers

## Societal

- Aging and more affluent population
- Greater demand for, and awareness of, better quality of life
- Preventive therapies
- Health care cost containment

## Technological

- Improved technological capabilities
- Optics & fiber optics
- Miniaturization of electronics
- Micro-fabrication
- Imaging technologies
- IT Improvements
- Nano, nano, nano
- Many others

# Why BME at SJSU?

- More than 1,100 biomedical companies in the Bay Area
- Silicon Valley – very high density of start-ups
- Close ties with industry
- Curriculum developed with industry professionals and experts
- Diverse student population – 46% female
- Inclusive, welcoming SJSU BMES Chapter
- Faculty who care about you

# Our Mission

*To be a recognized leader in translational biomedical research*

*To provide hands-on education focused on solving real world biomedical problems*

*And to foster innovation and entrepreneurship in the service of human well being.*

# Succeeding in our Program

- Curriculum Requirements
- Explore new areas, innovate!
- Participate in BMES initiatives
  - Annual Biomedical Device Conference
  - Peer Mentoring
  - Industry field trips
  - Social events
- Be involved
- Follow directions!!

# Curriculum Overview

| | |
|---|---|
| **General Ed**<br>• Humanities, etc. | Visit the<br>*Engineering Student Success Center* |
| **Lower Division Core**<br>• Basic math, science, and engineering courses | |
| **Junior Core**<br>• Intro BME courses | |
| Senior Core<br>• Upper-division BME courses | |
| **Senior Project** | *Must follow Fall-Spring sequence!* |

# Program Requirements

- Maintain a GPA $\geq 2.0$ in **all** coursework, with no individual grades lower than a "C-"
- Make sure you completed all pre-requisites
  - Most common problem is poor-grades
- **Mandatory** advising every semester
  - Advising hold on registration is removed only after advising
  - Spring 2019 Advising starts in late September… don't wait!
  - FOLLOW WHAT WAS AGREED TO DURING ADVISING
- Major Form: Submitted three semesters before graduation
  - E.g. June 1, 2019 for May 2020 graduation
- Graduation package sent out late October 2019

# Lower Division Core

- All first and second year math, science, engineering classes

| | |
|---|---|
| Math 30*, 31*, 32* | Engr 10*, BME 25* |
| Phys 50, 51 | BME 65 |
| Chem 1A*, 1B* | BME 68 |
| Biol 30* | EE 99 |
| Chem 8, 9 | |

**Starred courses must be completed with a GPA if 2.0 or higher, and no individual course grades lower than a "C-" before enrolling in the Junior Core*

- The entire Lower Division Core must be completed with a GPA of 2.0, and no individual grader lower than a "C-" before enrolling in the Senior Core

# Junior Core

- Introductory BME courses and upper-division math/science

  Math 123 or 133A  Engr 10*, BME 25*

  Engr 100W*

  BME 115, 117, 130, 174, 177

- The entire Junior Division Core must be completed with a GPA of 2.0, and no individual grade lower than a "C-" before enrolling in the Senior Core

- BME 115 – Foundations of Biomedical Engineering
- BME 117 – Biotransport Phenomena
- BME 130 – Numerical Methods in Biomedical Engineering
- BME 174 – Biomedical Regulatory Requirements
- BME 177 – Physiology for Engineers

# Senior Core

BME 147, 165, 168, 178, 198A, 198B

- BME 147 – Statistical Methods in BME
- BME 165 – Intro to Engineering Biomechanics
- BME 168 – Medical and Biological Polymers
- BME 178 – Biomedical Product Realization
- BME 198A,B – Senior Design Project

- Electives – three courses, advisor approval required
  - Biomedical Manufacturing Methods
  - Prosthetics & Orthotics
  - Others

# Fall 2019 Four-Year Study Plan

**SJSU B.S. BIOMEDICAL ENGINEERING 4-YEAR STUDY PLAN - Fall 2019**

*30-10-2018*

| | Fall | | | Spring | | |
|---|---|---|---|---|---|---|
| | Course Number | Course Title | Units | Course Number | Course Title | Units |
| Year I | Math 30 | Calculus I | 3 | Math 31 | Calculus II | 4 |
| | Chem 1A | General Chemistry | 5 | Chem 1B | General Chemistry | 5 |
| | Engl 1A | Composition I | 3 | Phys 50 | Mechanics | 4 |
| | Engr 10 | Intro to Engr | 3 | Engl 1B | Composition II | 3 |
| | Total | | 14 | Total | | 16 |
| Year II | Biol 30 | Principles of Biology I | 4 | Chem 8 | Organic Chemistry | 3 |
| | Math 32 | Calculus III | 3 | Comm 20 | Oral Communication | 3 |
| | AMS 1A | American Civilization | 6 | AMS 1B | American Civilization | 6 |
| | BME 25 | Intro to BME Design | 3 | Math 133A/ Math 123 | Ordinary Diff Eq, or Diff Eq and Linear Algebra | 3 |
| | Total | | 16 | Total | | 15 |
| Year III | BME 115 | Foundations of BME | 4 | BME 68 | BME Applics of Metals/Ceramics | 3 |
| | Phys 51 | Electricity/Magnetism | 4 | Engr 100W | Engineering Reports | 3 |
| | BME 177 | Physiology for Engineers | 3 | BME 174 | Biomedical Regulatory Requirements | 3 |
| | Chem 9 | Organic Chemistry Lab | 1 | BME 117 | Biotransport Phenomena | 3 |
| | BME 130 | Computational Methods in BME | 3 | BME 65 | Biomed Applics of Statics | 2 |
| | Total | | 15 | Total | | 14 |
| Year IV | BME 198A | Senior Project I | 2 | BME 198B | Senior Project II | 2 |
| | Engr 195A | Global/Social Issues | 1 | Engr 195B | Global/Social Issues | 1 |
| | BME 147 | Quantitative & Statistical Methods for BME | 3 | BME 178 | Biomedical Product Realization | 3 |
| | BME 168 | Medical/Biological Polymers | 3 | BME 165 | Applied Engineering Biomechanics | 3 |
| | EE 98 | Circuit Analysis | 3 | | One course from Major Electives | 3 |
| | | One course from Major Electives | 3 | | One course from Major Electives | 3 |
| | Total | | 15 | Total | | 15 |
| | *G. Selvaduray* | | | **TOTAL NUMBER OF UNITS** | | **120** |

**Important Notes**

(1) Lower Division Core (LD core): Math 30*, Math 31*, Math 32*, Phys 50*, Phys 51, Chem 1A*, Chem 1B*, Biol 30*, Engr 10*, BME 25*, CE 99, MatE 25, and EE 98. Those with an asterisk (*) must be completed with a GPA of ≥2.0, & no individual course grade < C- before enrolling in Junior Core classes. The entire Lower Division Core, must be completed, also with a GPA of ≥ 2.0, & no individual course grade < than C- before enrolling in Senior Core classes. Co-enrollment of EE 98 with BME 198A is permitted.

(2) Junior Core: Math 133A or Math 123, BME 115, BME 117, BME 130, BME 174, BME 177, and Engr 100W. Must be completed with a GPA ≥ 2.0, and no individual course grade < C- before enrolling in Senior core classes.

(3) Senior Core: BME 147, BME 167, BME 175, BME 178, BME 198A, and BME 198B. The entire Senior Core must be completed with a GPA ≥ 2.0 and no individual course grade < C-.

http://www.sjsu.edu/bme/docs/Degree-Roadmap-BME-4-Year-Plan-Fall-2019-Nov-26-2018.pdf

# Advising Form

**Biomedical Engineering Department**
**Undergraduate Advising Form – Fall 2019**
*Please complete your list of proposed classes in pencil before coming in to see your advisor.*

| | |
|---|---|
| Name: | ID# |
| Major: | Contact Phone #: |
| Street Address: _____ | |
| City/State/Zip: _____ | |
| E-mail address: _____ | |
| Proposed Classes | |
| 1. | 2. |
| 3. | 4. |
| 5. | 6. |
| Possible Alternative Classes | |
| 1. | 2. |
| Total Class Units_____ Graduation Application Submitted? Yes____ No _____ | |
| Total work hours per week outside school:____ Change of Major In Progress? Yes____No____ | |
| Major Form Submitted: Yes_____ No _____ | |
| Other advising notes: Join Google Groups BCME Undergraduates (https://groups.google.com/a/sjsu.edu/forum/#!forum/bcme-undergrad-group) | |
| Student Signature*: | Date: |
| Advisor Signature: | Date: |
| Hold flag removed by: | Date: |
| Database updated: | ListServ Updated: |

**Please allow a minimum of 5 working days for your Advising Hold to be removed.**



http://www.sjsu.edu/bme/docs/BS-BME-Fall-2019-Advising-Form.pdf

# Fall 2019 BME Courses Offered

| Course # | Course Title | Units | Days | Times | Location |
|---|---|---|---|---|---|
| BME 25 | Introduction to Biomedical Engineering Design<br>***Lab meets separately – check for lab times*** | 3 | M | 1800 - 1950 | ENG 331 |
| BME 68 | Biomedical Applications of Metals and Ceramics | 3 | MW | 1500-1620 | ENG 343 |
| BME 115 | Foundations of Biomedical Engineering<br>***Lab meets separately – check for lab times*** | 4 | TuTh | 1330 – 1450 | ENG 343 |
| BME 117 | Biotransport Phenomena | 3 | TuTh | 1200 – 1320 | ENG 343 |
| BME/EE 127 | Electronics for Biomedical Applications | 3 | TuTh | 1800 – 1915 | |
| BME 130 | Numerical Methods in Biomedical Engineering<br>***Lab meets separately – check for lab times*** | 3 | MW | 1200 – 1250 | CL 222 |
| BME 147 | Quantitative and Statistical Methods for Biomedical Engineers | 3 | W | 1800 – 2045 | CL 222 |
| BME 168 | Medical and Biological Polymers<br>***Lab meets separately – check for lab times*** | 3 | MW | 1030 – 1120 | WSQ 109 |
| BME 177 | Physiology for Engineers<br>***Lab meets separately – check for lab times*** | 3 | MW | 1630 – 1720 | BBC 108 |
| BME 188 | Biomedical Device Manufacturing | 3 | TuTh | 1630 - 1750 | SCI 342 |
| BME 198A | Senior Design Project I<br>***Lab meets separately – check for lab times*** | 1 | F | 0930 – 1020 | ENG 341 |
| BME 274 | Regulatory, Clinical and Manufacturing Aspects of Medical Devices | 3 | T | 1800 – 2045 | BBC 004 |
| BME 256 | Nanoplatforms | 3 | Th | 1800 – 2045 | BBC 004 |
| BME 291 | MS Thesis/Project Preparation Seminar | 1 | F | 1500 – 1745 | TBD |
| BME 298 | MS Research/Project | 2 | F | 1500 – 1745 | TBD |
| BME 299 | Master's Thesis | 1~3 | F | 1500 – 1745 | TBD |

# Fall 2019 – Important Dates

| | |
|---|---|
| Aug 21 | First day of classes; Add/Drop begins |
| Aug 31 | Last day to drop classes without a 'W' grade |
| Sept 2 | Labor Day – Campus Closed (Monday) |
| Sept 3 | Last day to drop classes without a 'Withdraw' |
| Sept 10 | Last day to add classes |
| Sept 15 | WST Exam |
| Oct 20 | WST Exam |
| Nov 11 | Veterans Day – Campus Closed (Monday) |
| Nov 27 | Non-instructional holiday (no classes) |
| Nov 28-Dec 1 | Thanksgiving Break – Campus Closed |
| Dec 9 | Last day of classes |
| Dec 11-17 | Final Examinations |
| Dec 18-19 | Fall commencement Ceremonies |
| Jan 21 | Spring 2019 first day of classes |

# People

- Faculty
- Industry Advisory Committee
- Students

# Faculty

Guna Selvaduray, PhD
*Department Chair*
*Professor*

Folarin Erogbogbo, PhD
*Asst. Professor*

Alessandro Bellofiore, PhD
*Asst. Professor*

Melinda Simon, PhD
*Asst. Professor*

Matthew Leineweber, PhD
*Asst. Professor*

Patrick Jurney, PhD
*Asst. Professor*

## Matt Leineweber

Ph.D. Mechanical Engineering (Biomechanics), Cornell University

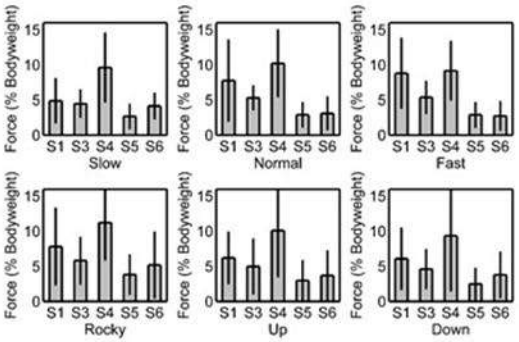
M.S. Mechanical Engineering, Cornell University

**Research Interests**

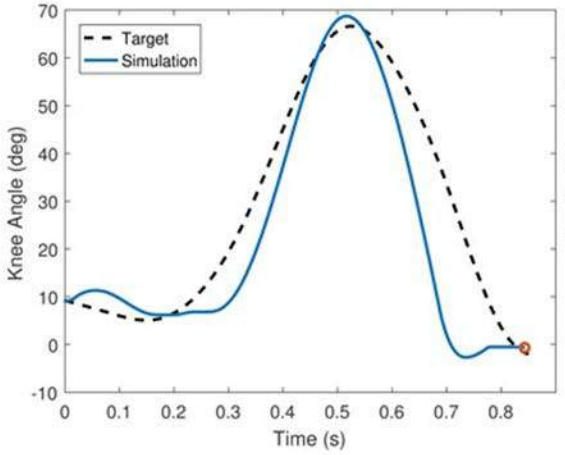
- Research-driven design of mobility assistive devices in real-world environments
- Computer simulations of human gait with lower-limb prostheses
- Use of additive manufacturing for flexible and low-cost prostheses
- Developing sensory biofeedback systems for lower-limb amputees

**Recent Publications**

- Likitlersuang et al. *Medical Engineering Physics*. 2017.
- Leineweber et al. *Journal of Visualized Experiments*. 2016.
- Leineweber et al. *Adapted Physical Activity Quarterly*. 2016.
- Sharma et al. *Journal of Rehabilitation Research and Development*. 2016.
- Rogers et al. *Assistive Technology*. 2016.




*Understanding interfacial force distributions help design crutch handles that may reduce the prevalence of carpal tunnel syndrome*




*Evaluating a prosthetic knee by comparing natural gait to prosthetic gait using computer simulations*

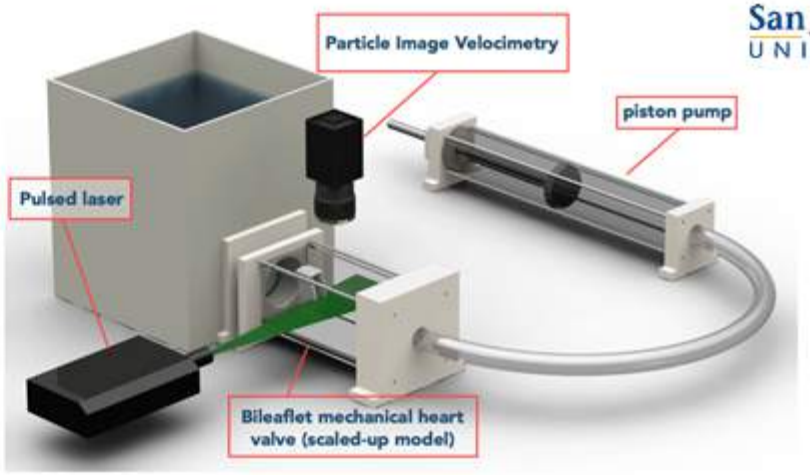
*3D printing with flexible materials for a lightweight and functional infant hand prosthesis*

Ph. D. Chemical Engineering – Universitá Federico II, Napoli, Italy
M.S. Chemical Engineering – Universitá Federico II, Napoli, Italy

San José State UNIVERSITY

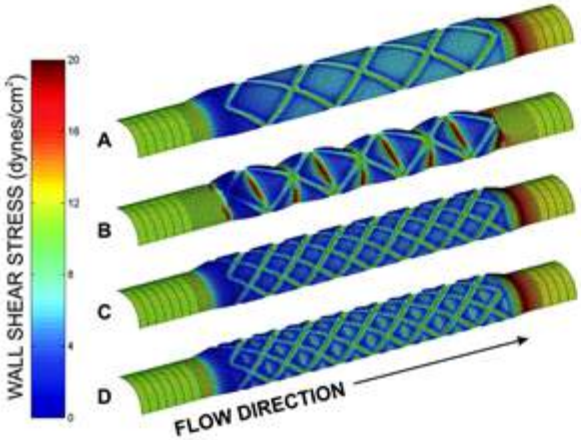
## Research Interests

*Fluid mechanics of biomedical devices, Hemodynamics, Cardiovascular mechanics, Particle Image Velocimetry*




Scaled-up model of a mechanical heart valve. The experiment was designed to investigate the shear-induced blood damage due to the valve.

## Current Projects

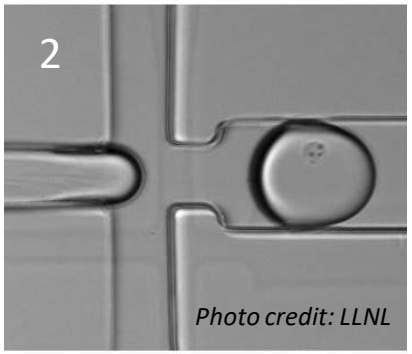



***Numerical investigation of the hemodynamic performance of drug-eluting stents***
*(Image from LaDisa et al., 2005)*

***In Vitro Hemocompatibility Test Methods for Coronary Stents***
*(www.chandler-loop-system.de)*

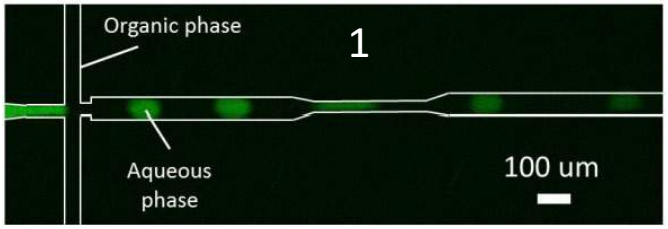
***Cost-based Analysis of Heart Tissue Decellularization Protocol Efficacy***

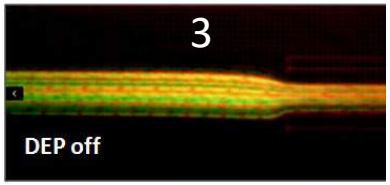
Ph.D. Biomedical Engineering - University of California, Irvine
M.S. Biomedical Engineering - University of California, Davis
B.S. Chemical Engineering - University of Cincinnati

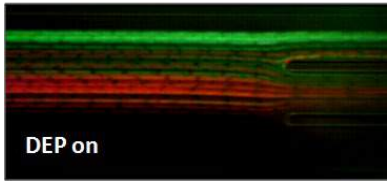


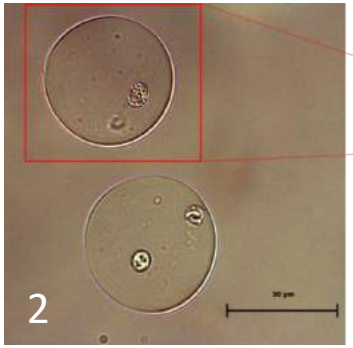

Lab expertise:

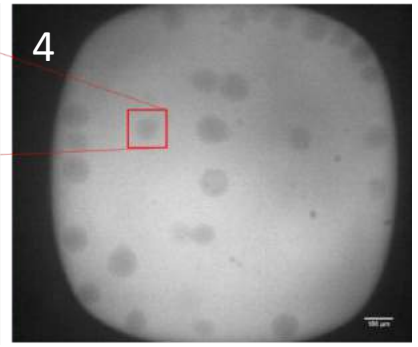
1. Production of picoliter, nanoliter droplets
2. Cell encapsulation using microfluidics
3. Cell sorting using dielectrophoresis (DEP)
4. Droplet manipulation using EWOD (electrowetting-on-dielectric) technology



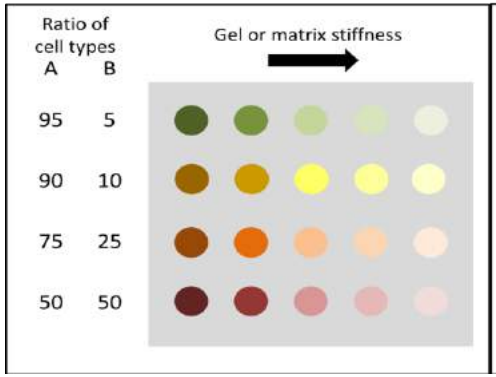



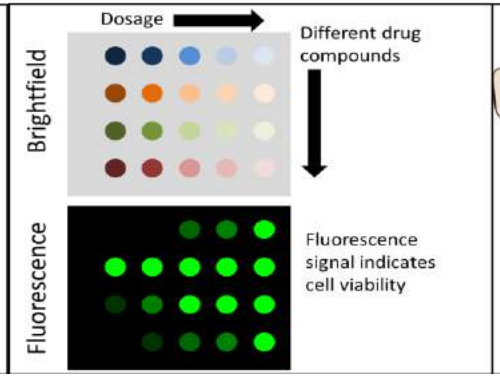



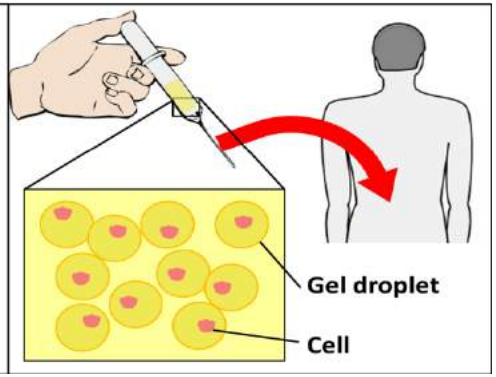

Cancer cells encapsulated in alginate beads. (right)
Alginate beads inside a 0.3 µL droplet on an EWOD device.

Research interests

Tissue engineering screening | Drug dosing/toxicity studies | Vehicles for stem cell therapy



Ph. D. Biophotonics – University at Buffalo (SUNY)
B.S. Chemical Engineering – University at Buffalo (SUNY)

## Research Interest :

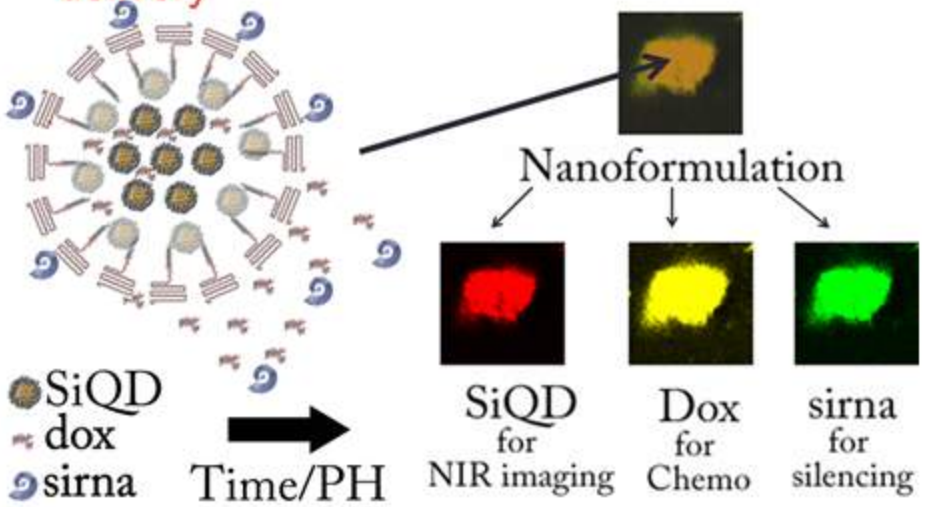
Elucidating the fundamental relationships between nanoparticle synthesis conditions and desirable nanoparticle properties for biomedical applications.

## Lab Expertise:

Gas phase synthesis of nanoparticles

Engineering silicon for biomedical applications

NIR Silicon QD for tracking Drug and RNA delivery




## Recent Publications:

Erogbogbo et al.,
Theranostics 3 (9), 719, 2013

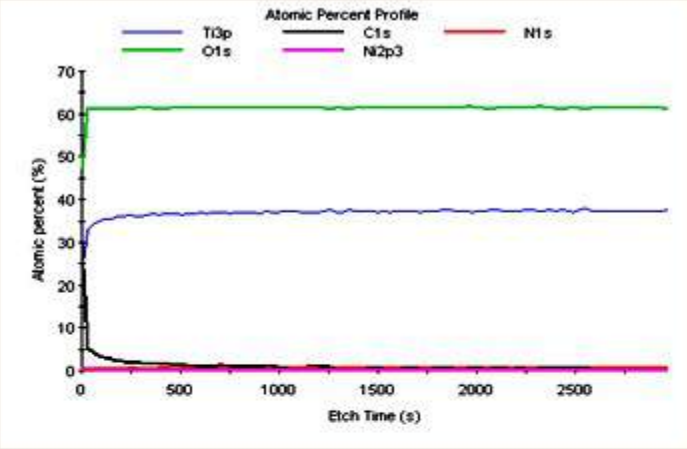
Erogbogbo et al.,
ACS Nano 7 (8), 7303-7310, 2013

# Research Interests

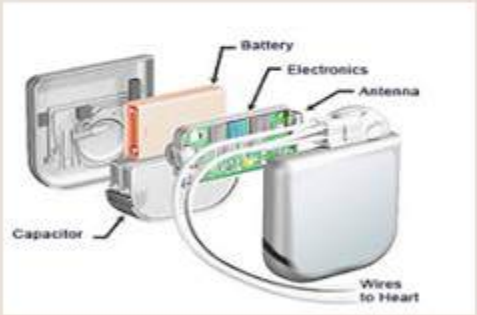
*Surface modifications and biocompatibility of implantable materials*
*Solder joint reliability*
*Earthquake hazard mitigation*

# Current Projects

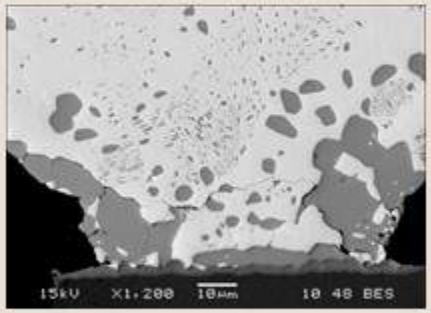
*Dip-coating of sol-gel hydroxyapatite on Ti substrates*
*Development of Ni-free $TiO_2$ coating on Nitinol*
*Effect of irradiation on polymers*
*Creep of Pb-free solders for medical electronics*
*Biomimetics*




X-ray photoelectron spectroscopy depth profile of the specimen nitrided in 96% $N_2$ + 4% $H_2$ at 1000°C for 20 min and oxidized in air at 700°C for 60 min.




Electronic components of defibrillator; Source: http://www.heartonline.org/defibrillator.htm (Accessed Sept 5, 2012)




Solder joint creep failure

# Industry Advisory Council

Jennifer Matteus
*Director, Stryker Neurovascular*

Maurino Flora
*Managing Director APOMed Consultants*

Michael Reo
*Industry Veteran Consultant*

Michael Passaglia
*Cannon Quality Group*

Ray Chia, Ph.D.
*KLA*

Todd Thompson
Proteus Digital Health

Felix Vega, D. V. M.
Preclinical Consultant

## Other Members

Greg Bennett
*Abaxis*

*Roger Guidi*
*Healthcare Associates*

Janie Mandrusov, Ph.D.
*Sinopsys*

BMES SJSU

BIOMEDICAL ENGINEERING SOCIETY

Preview

# About Us

**Purpose**

**Promote the professions of BME through study, research, & discussion**

**Mission**

**Supplement academic knowledge gained in class with professional, community, and social activities.**

**Goal**

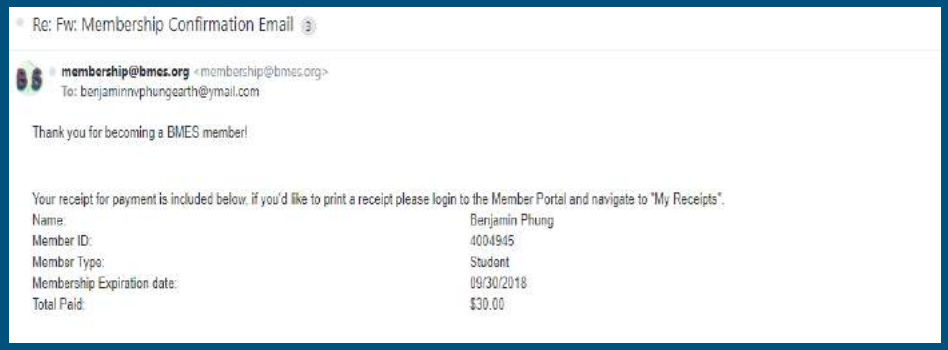
**Provide benefits and value to our members and the University as a whole**

## Programs

- Outreach
- Mentorship
- Health and Fitness
- BMEidea

## Events

- National BMES Conference
- Bay Area Biomedical Device Conference
- General Meetings
- Company Tours
- Guest Speaker Events



Re: Fw: Membership Confirmation Email

**membership@bmes.org** <membership@bmes.org>
To: benjaminnvphungearth@ymail.com

Thank you for becoming a BMES member!

Your receipt for payment is included below. If you'd like to print a receipt please login to the Member Portal and navigate to "My Receipts".

| | |
|---|---|
| Name: | Benjamin Phung |
| Member ID: | 4004945 |
| Member Type: | Student |
| Membership Expiration date: | 09/30/2018 |
| Total Paid: | $30.00 |

## HOW TO JOIN

1. Obtain Membership from the National BMES
   a. Bmes.org
   b. $30 for students
2. Forward your confirmation email attached with the contract to us
   a. sjsubmes@gmail.com
3. Fill out Membership Update form on our Website

## HOW TO GET YOUR DOOR CODE

1. Be a BMES Member
2. Fill out Clubroom Rules Contract
   a. Complete electronically (recommended)
3. Email us the Contract: sjsubmes@gmail.com

Biomedical Engineering Society (BMES) Clubroom Rules

The Biomedical Engineering Society (BMES) Club Room is located in Room 182 of the Engineering Building and is reserved for the exclusive use of BMES members only. The purpose of the room is for members to have an available space dedicated to interacting with other members, relaxation, snacks, studying, meetings, etc.

The people in charge of the BMES Club Room are Professor Guna Selvaduray and the Chair of the BMES Clubroom Committee. BMES members in good standing with the chapter have the right to use the club room ONLY after they have informed the Chair of the BMES Clubroom Committee AND obtained an access code from Dr. Selvaduray. Every BMES member using the room must have their own access code. Access codes will be assigned only upon receipt of a signed copy of this document.

All users of the BMES Club Room are required to follow the following rules at the very minimum:

1. The Club Room must be maintained in a tidy and orderly manner at all times. This includes picking up after yourself & disposing of the trash whenever necessary.
2. The coffee maker, refrigerator, & microwave must be cleaned promptly after use.
3. The lights must be turned off whenever leaving the room, if no one else is present.
4. All wrappers from food and drinks MUST be discarded in the available trash cans.
5. All empty boxes from unpacking must be appropriately disposed immediately.
6. All boxes and containers in the kitchen must be immediately closed after use.
7. The assigned code must not be shared with anybody else, otherwise all access privileges will be suspended immediately and for an indefinite amount of time.
8. All BMES members are responsible for updating the 'check list' of items (snacks and refreshments) that need to be restocked at all times.
9. All BMES members will be assigned a particular week during the semester to monitor the room for cleanliness and availability of snacks. The assigned member for that week will also be in charge of their assigned tasks, such as vacuuming the room and emptying the fridge every Friday, as well as purchasing snacks and refreshments during the weekend.
   *These tasks need to be carried out multiple times throughout the time period they are assigned, so that the room is always maintained and kept clean. Failure to monitor the room on an assigned week will result in privileges suspended for an indefinite amount of time.*
10. No food items should be left in the refrigerator after Fridays. All food items will be discarded at the end of the day every Friday.

Printed name _____ Signature _____ Date _____

BMES ID number _____ SJSU Student ID _____

BMES membership expiration date _____ Door Code _____ Email address _____

# Student Rights & Responsibilities

- **Responsibilities**
  - Academic honesty
  - Will not give or receive unauthorized assistance
  - Plagiarism
  - **http://www.sjsu.edu/studentconduct/Students/Student_Academic_Integrity_Process/**
- **Rights**
  - Fair grading – demand it!
  - Access to records *(only your own)*
  - Office hours – use it!

# Other Pertinent Information

- All forms *electronically* available at relevant websites
  - Location varies, depending upon form
  - Keep copies of all paperwork/forms submitted

- **Probation**
  - University and College of Engineering requirements
  - Check Academic Advising and Retention Services website
    - http://www.sjsu.edu/aars/policies/probation/

# More about SJSU

- Classes – harder to  enroll, especially UG classes
  - Enroll as early as you can!
- Parking – bad, getting *badder*
- International Student Services (Clark Hall Room 543)
- MLK Jr Library
  - Online Search & Interlibrary Loan Services
  - Largest public library west of the Mississippi
- Event Center & Exercise Facilities
- Spartan Bookstore
- Good restaurants within walking distance

# Important things to know (from last year's graduates)

- "Making friends with the same academic values has helped me most because when studying, teamwork has helped a lot."

- "I realized quickly it's not the same as high school. Self motivation to keep up with coursework was one of the greatest obstacles because of the difficulty of this major. But to overcome it, I had to believe to not give up because at the end it'll be worth it. It doesn't matter how long it takes you. What matters is that you're able to finish what you started."

- ***What did you wish you knew as a freshman?***
  - "The importance of GE classes before taking BME classes. Each of them didn't seem interesting as I was eager to take BME classes, but after going through the curriculum, each class was crucial."

# What people are saying…

*….. I've told a number of my Stanford colleagues about what an outstanding biomedical engineering program you run for your students and even mentioned to folks in our postdoc office how much my postdoc loves working with and teaching your excellent masters students! Plus we are now setting up new SJSU - Stanford collaborations. What a great alliance!!!*

*Stefanie Jeffrey, MD*
*John and Marva Warnock Professor*
*Department of Surgery*
*Chief of Surgical Oncology Research*
*Stanford University School of Medicine*

*….. I enjoyed meeting many of the BMES students at the poster session. I was very impressed with how well the students ran a complex and large event.*

*I must say, I was also quite impressed with the students themselves. As a group, I found them unusually poised, friendly, and well-spoken, and I was impressed at how well they could describe their research and ideas. These are skills that are especially important to my type of business, which requires both excellent engineering – and - social skills. I wish I could hire them all, I was so charmed! My compliments to you and your colleagues for a great job preparing these young engineers for their careers.*

*Alissa M. Fitzgerald, Ph.D.*
*Founder and Managing Member*

# Thank you very much for your attention

- Questions
- Comments
- Ideas
- Anything else???

*Enjoy your semester!*