Welcome to

CardioLab Orientation
Your Path to Graduation

Who am I?

- Alessandro Bellofiore, PhD

- Assistant Professor & Graduate Advisor, BME Department

- Research group: **CardioLab**

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CardioLab Orientation

Your path to graduation
video + slides

CardioLab: rules and expectations
video + slides

CardioLab: deliverables, deadlines and projects
live session

Orientation: Your Path to Graduation

◉ Why this video?

- this video will cover general guidelines and tips to:

  - enjoy your project journey

  - avoid any unnecessary roadblock and slowdowns on your way to complete your project and graduate

◉ Whom is this video for?

- all students starting

  - senior design project, or

  - MS project/thesis

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Checklist for MS Degree

MS-BME degree Checklist - November 2019.pdf

Biomedical Engineering Department
College of Engineering, San José State University
One Washington Square, San Jose, CA 95192-0080
Tel: (408) 924-4000

Checklist for Completing the M.S. Biomedical Engineering Degree

In addition to the items listed in this Checklist, please also visit the Graduate Admissions and Program Evaluations Office's website at:

http://www.sjsu.edu/gape/current_students/completing_masters/

It provides a comprehensive listing of the university requirements you have to meet in order to complete your MS degree.

Important note before you begin reading further:

Keep a photocopy of all documents that you submit to the university!

Roadmap

- Get started
- Join a research group
- Obtain access to the lab
- Get proper training

- Write your project proposal
- Defend your proposal
- Obtain necessary clearance for your research: IRB, IACUC

- Perform your experiments/simulations
- Write your final report
- Disseminate your results
- Defend your project
- Complete your *project close-out and handover*
- **You graduate**

Get started

- **When?**
  - BS students: Spring/Summer before you enroll in BME 198A
  - MS students: at least one semester before you enroll in BME 291

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Get started

- **When?**
  - BS students: Spring/Summer before you enroll in BME 198A
  - MS students: at least one semester before you enroll in BME 291

☑ Identify topic areas of interest and one or more **prospective technical advisors** (usually, BME faculty)

☑ Inquire with prospective technical advisors for **available projects**

☑ (*Optional*) Identify **team mates**

☑ Explore **funding opportunities**

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Get started

- **When?**
  - BS students: Spring/Summer before you enroll in BME 198A
  - MS students: at least one semester before you enroll in BME 291

☑ Identify topic areas of interest and one or more **prospective technical advisors** (usually, BME faculty)

☑ Inquire with prospective technical advisors for **available projects**

☑ (*Optional*) Identify **team mates**

☑ Explore **funding opportunities**

☑ *For MS students:* will you pursue a **project** or a **thesis**?

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Join a research group

- **When?**
  - BS students: Summer before you enroll in BME 198A
  - MS students: Two months before you enroll in BME 291

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Join a research group

- **When?**
  - BS students: Summer before you enroll in BME 198A
  - MS students: Two months before you enroll in BME 291

☑ Choose the general topic area of your project
☑ Select ≥1 project of interest in that topic area
☑ Email prospective technical advisor to apply for the selected project(s)

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Join a research group

- **When?**
  - BS students: Summer before you enroll in BME 198A
  - MS students: Two months before you enroll in BME 291

☑ Choose the general topic area of your project
☑ Select ≥1 project of interest in that topic area
☑ Email prospective technical advisor to apply for the selected project(s)

- You email should include a very brief description of:
  - the unique commitment and skillset you will bring to that specific project
  - what you anticipate you will learn from that specific project
  - your resume

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Join a research group

- You can email your prospective technical advisor as an **individual** or as a **team**.

  - If it is a team, make sure to include all the names and resumes in your email. Describe the relevant skillset brought by the whole team.

- Based on the inquiries received, technical advisors will assign their projects to student teams.

  - The technical advisors will do their best to accommodate everyone's request, **as long as you demonstrate a commitment to be engaged and productive.**

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Join a research group

- What if you want to pursue a project not included in any advisor's portfolio?

- In general, an advisor's ability to accommodate additional, off-topic projects is limited.
  - You will have to go the extra mile to really convince them of the significance and feasibility of your idea, and that they are the most suitable to be your advisor.

Join a research group

- At this point, it is likely that your prospective technical advisor will assign one or more of the following tasks:
  - ☑ Get familiar with the basic concepts of your topic
  - ☑ Complete a critical review of the relevant literature
  - ☑ Draft a list of (tentative) specific aims of your project
  - ☑ Draft a work plan for your project
  - ☑ Other reading, writing assignments

- One of the goals of these assignments is to assess your interest and commitment to be engaged and productive.

  - **If you don't complete these assignments in time, you may not be able to join that research group.**

Day one of your project

- **When?**
  - BS students: first day of BME 198A class
  - MS students: first day of BME 291 class

- The course instructor will ask you to provide the following information:
  - ☑ Your technical advisor
  - ☑ Tentative title of your project
  - ☑ (*optional*) Your team
  - ☑ MS students: your reading committee
    - 2 members for MS project
    - 3 members for MS thesis

Obtain access to the lab

- **When?**
  - BS students: August-September
  - MS students: by the beginning of your BME 291 semester

☑ Identify the lab(s) that you will be using for your project

☑ Fill out one **BME Omnilock Request Form**
at https://tinyurl.com/yb3uowbh
to request lab access **for each lab** you identified.

☑ Complete the training in the Canvas shell on Lab Safety

☑ Pass the Canvas final quiz with 100% score

☑ Obtain a key code for lab access from Neil Peters

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Get proper training

- **When?**
  - BS students: September-November
  - MS students: first two months of your BME 291 semester

☑ Identify the lab techniques that you will likely use for your project

☑ Identify the lab equipment that you will likely use for your project

☑ Identify the software that you will likely use for your project

☑ Discuss options for training with your technical advisor

☑ Complete your training

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Write your project proposal

- **When?**
  - BS students: September-November
  - MS students: during your BME 291 semester

Chapter 1	☑ Write an introduction on the unmet clinical need that motivates your project
Chapter 2	☑ Read ≥20 (MS: ≥30) peer-reviewed papers related to your project
	☑ Create a list of topics that compound a rationale for the need for your project
	☑ Write a lit review articulated using the topics and reference you identified
Chapter 3	☑ Review and revise the Specific Aims you prepared during the summer
	☑ Use revised Specific Aims to write a one-page Research Objectives
Chapter 4	☑ Write the Materials and Methods section of your proposal

☑ Submit a complete draft of your proposal

☑ Prepare a presentation of your proposal

☑ Submit a draft of your slides

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IRB/IACUC clearance

- **When?**
  - BS students: September-November
  - MS students: during your BME 291 semester

- If your project involves research with human subjects, animals or biological tissues, you will need IRB or IACUC approval before you can start your experiments.
  - ☑ Determine whether you need full review, expedited review, or exemption
  - ☑ Prepare application, protocol narrative, additional documentation
  - ☑ Submit to your technical advisor for review and approval
  - ☑ Submit to IRB/IACUC for review and approval

- NOTE: the process may take more time than you anticipate. **START EARLY!**

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Perform your experiments/simulations

- **When?**
  - BS students: December-March
  - MS students: during your BME 298 semester

- Depending on your project, your experimental work will involve:
  - design and prototype a device
  - create and refine SOPs
  - set up your test rig or numerical models
  - collect data or run simulations
  - (validate and) process data (*direct endpoints*)
  - analyze data (*calculated endpoint*)
  - perform statistical analysis (e.g. to test your study hypothesis)
  - organize results into plots and tables

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Write your final report

- **When?**
  - BS students: February-April
  - MS students: during your BME 298 semester

Chapter 5
- ☑ Describe all the results you obtained from your experiments/simulations
- ☑ Every figure and table should be properly reference and described in detail

Chapter 6
- ☑ Discuss the major findings and outcomes of your project
- ☑ Compare and contrast with prior knowledge (e.g. from lit review)
- ☑ Discuss the potential technological and clinical impact of your results
- ☑ Discuss the main limitations of your study

Chapter 7
- ☑ Summarize the main conclusions of your project

- ☑ Include title page, TOC, abstract (and appendices) as per guidelines
- ☑ Submit a complete draft of your final report and your slides/poster

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Write your final report: senior projects

- **When?**
  - BS students: February-April
  - MS students: during your BME 298 semester

- BS students: Final Poster and Report Draft
  - due to your technical advisor by the beginning of May

Write your final report: senior projects

- **When?**
  - BS students: February-April
  - MS students: during your BME 298 semester

- MS students: Final Draft
  - due to your technical advisor 4 weeks before your tentative defense date
  - due to reading committee no later than one week before your defense

- In addition:
  - Contact reading committee to find a suitable date for your defense, about 4 weeks before your tentative defense date
  - Send your technical advisor a draft of your presentation slides at least one week before your defense date.

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Disseminate your results

- You are expected to disseminate the results and findings of your projects, through one or more of the following avenues:

  - conferences

  - publications

  - grant proposals

- Your technical advisor and you will work out a dissemination plan that best suits your type of project and the timeline for your graduation.

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Project close-out and handover

- **After you complete your project**
  - BS students: June-August
  - MS students: YMMV

- Share with your technical advisor:
  - ☑ a folder with all the papers you reviewed
  - ☑ a folder with all the deliverables you generated
    - reports
    - slides
    - IRB/IACUC protocols
    - manuscripts
    - conference abstracts
  - ☑ a folder with all the experimental/numerical data you generated and analyzed

Project close-out and handover

⊙ **After you complete your project**

- ⊙ BS students: June-August
- ⊙ MS students: YMMW

☑ Clean up your lab space

☑ Return any computer or other equipment you borrowed for your project

☑ Remove perishables from refrigerators

☑ Dispose chemical and biological waste appropriately

☑ Provide documentation and instructions for new equipment and software (not already documented), for the benefit of future students

☑ **Be available to train the students taking over your project**

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Summary

- We have reviewed the essential steps to your graduation.

- Please discuss with your technical advisor any requirements and expectation specific to their research group.

- Following the program's and advisor's guidelines will:

  - speed up your journey to graduation

  - spare you unnecessary setbacks, delays and frustration

  - help you make the best out of the culminating experience of your college adventure

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