Graduate Student Handbook Department of Mechanical and Biomedical Engineering (MBE)

Master of Science in Mechanical Engineering (MSME)

Master of Engineering in Mechanical Engineering (MEngME)

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Introduction

Welcome to the Department of Mechanical and Biomedical Engineering at Boise State University!

We are proud to offer two graduate degree programs at the master's level, designed to support both professional and research-oriented career paths:

- Master of Science in Mechanical Engineering (MS ME): A research-focused, thesis-based program that culminates in the development and presentation of an independent and novel research project. This program is ideal for students pursuing careers in research and development or planning to continue their studies at the doctoral level.
- Master of Engineering in Mechanical Engineering (MEngr ME): A non-thesis, professionally oriented program that emphasizes advanced coursework and professional development. Students in this program have the option to complete either a traditional comprehensive exam or a project-based culminating activity, allowing them to apply their knowledge to real-world engineering challenges.

This handbook serves as a guide to the processes and procedures required for the successful completion of a graduate degree from our department. Whether you are preparing for a career in research, industry, or further doctoral studies, we are committed to supporting your academic and professional growth.

Disclaimer: The Boise State University Graduate Catalog

This document serves as a convenient resource for students in the Mechanical Engineering graduate programs. While we strive to ensure that the information provided is accurate and up to date, the official Boise State University Graduate Student Catalog remains the authoritative source for all university programs.

In the event of any discrepancies between this manual and the official catalog, the catalog takes precedence. Students are strongly encouraged to access the catalog online and familiarize themselves with its contents.

MS ME and MEng ME At a Glance

Feature	MS ME	MEng ME
Degree Type	Thesis-based	Non-thesis
Focus	Research oriented	Industry oriented
Culminating Activity	ME 593 Thesis (6-12 credits, 6 required)	ME 690 Comprehensive Exam or Project-Based Activity (1 credit)
Core Courses Required	10 credits	10 credits
Engineering Professional Development	ME501 (1 credit)	ME501 (1 credit)
Continuum Mechanics	ME510 (3 credits)	ME510 (3 credits)
Applied Mathematics Core	MATH 527, 536, or 537 (3 credits)	MATH 527, 536, or 537 (3 credits)
Computational Core	MATH 565, 571, 572; ME 536, 570, 571; or another approved course (3 credits)	MATH 565, 571, 572; ME 536, 570, 571; or another approved course (3 credits)
Additional Mechanical Engineering Courses	8-14 credits	11-20 credits
Thesis Credits	6 credits	0 credits
Non-ME Graduate Courses	Up to 6 credits	Up to 9 credits
Total Credits Required	30 credits	31 credits
Assistantship Availability	Available (GRA, GTA)	Usually not.
Health Insurance Requirement	Required according to ACA	Required according to ACA
Timeline for Completion	2 years typical (varies by individual)	Varies, recommended timeline provided
Advisor Role	Active role in course selection and research guidance	Coordinated by the graduate committee or faculty committee for PBCA
Accelerated Master's Option	Available	Available with prior approval

Degree Requirements

The Core

The faculty of the Mechanical and Biomedical Engineering (MBE) Department has determined that a structured core curriculum best supports our graduate programs and the students enrolled in them. To build a strong foundation for graduate studies, 10 of the 30-31 required credits (three 3-credit courses and one 1-credit course) are designated as core requirements.

Since these courses are designed to provide essential knowledge and skills, *students are strongly encouraged to complete the core requirements within their first year of graduate study*. Further details on these requirements are provided in the following sections.

Engineering Professional Development (ME 501) - Only offered in the Fall
This course explores best practices in technical communication of advanced engineering concepts, helping students develop the skills needed to effectively convey complex ideas. It also focuses on professional skill development to support career advancement, ensuring that graduates are well-prepared for leadership roles in engineering. Additionally, the course increases awareness of engineering ethics, emphasizing the importance of ethical decision-making in professional practice.

Continuum Mechanics (ME 510) - Only offered in the Fall
While all students entering the Master of Science or Master of Engineering programs will have completed numerous undergraduate courses in mechanics, the study of continuum mechanics provides the theoretical and mathematical foundation for the broader field of mechanics, encompassing both solid and fluid mechanics. Regardless of research interests or current field of employment, this course serves as a critical building block for advanced coursework and professional growth.

Applied Mathematics Core (MATH 527 or MATH 536 or MATH 537)
The key distinction between undergraduate courses and graduate study lies in the level of mathematical rigor applied to analysis. These courses are designed to reflect the standards of graduate engineering curricula nationwide and were developed in consultation with engineering faculty to ensure their relevance and rigor.

Computational Core (MATH 565 or MATH 571 or MATH 572 or ME 536 or ME 570 or ME 571 or another course with a computational emphasis approved by the student's advisor.)
Computational methods are widely used across various fields to analyze complex engineering systems. Whether data is generated through simulation or experimentation, engineers must be able to process, manipulate, and interpret it using mathematical and statistical methods for effective problem-solving. As a result, our graduate program requires students to demonstrate proficiency in computational methods and computer

programming. It is important to note that simulation-intensive courses relying solely on black-box software do not fulfill the computational core course requirement. To meet this requirement, students have several course options available and are encouraged to consult with their advisor to select the most appropriate course for their field of study.

Mechanical Engineering Graduate Courses

The remaining coursework required to meet degree requirements should be selected in consultation with the student's major advisor and aligned with their educational and career goals. Mechanical Engineering graduate courses (8-14 credits for MS ME and 11-20 credits for MEngr ME) must be chosen from 500-level ME courses.

Important Notes:

- Some courses are cross-listed at the 400/500 level. If a student has already completed the 400-level version as an undergraduate, they cannot count the 500-level version toward this requirement.
- A maximum of 3 total credits from Independent Study (ME 596) or Directed Research (ME 696) may be applied toward this requirement.
- ME 505 Mechanical Engineering Teaching Experience (1-3-2)(F/S). Provide teaching support in a mechanical engineering class under faculty supervision. Duties may include teaching a lab section, holding office hours, and overseeing projects. Content includes basic pedagogy and teaching skills. (Pass/Fail.)

Non-Mechanical Engineering Graduate Courses

Students may apply up to 6 credits for the MS ME and up to 9 credits for the MEngr ME from non-ME graduate courses to fulfill graduation requirements.

Thesis Credits Requirements (MS ME)

A minimum of 6 credits of thesis work (ME 593) is required for the MS degree. Although students often accumulate additional thesis credits, exactly 6 will be applied toward their degree requirements. It is strongly recommended that students consult with their advisor before enrolling in thesis credits to determine the appropriate number for each semester. Additionally, students must be enrolled in at least 1 thesis credit during the semester in which they defend their thesis.

Comprehensive Exam/Project-Based Culminating Activity (MEngr ME)

In their final semester, students enrolled in the Master of Engineering (MEngr) program must register for ME 690: Master's Comprehensive Examination. Students who choose the Project-Based Culminating Activity (PBCA) as an alternative to the traditional exam-based assessment must still enroll in ME 690.

Masters of Science Degree Requirements, Catalog Statement[1]

Course Number and Title	Credits
Mechanical Engineering and Mathematics Core	
Take the following:	4
ME501 - Engineering Professional Development (1) ME510 - Continuum Mechanics (3)	
Take at least 1 of the following:	3
MATH527 - Introduction to Applied Mathematics for Scientists and Engineers (3) MATH536 - Partial Differential Equations (3) MATH537 - Principles of Applied Mathematics (3)	
Take at least 1 of the following:	3
MATH565 - Introduction to Numerical Methods (3) MATH571 - Data Analysis (3) MATH572 - Computational Statistics (3) ME536 - Computational Fluid Dynamics (3) ME570 - Finite Element Methods (3) ME571 - Parallel Scientific Computing (3) OR Another course with a computational emphasis approved by the student's advisor.	
Additional Courses:	14
Mechanical Engineering Graduate Courses (8-14)	
Take between 8 and 14 credits from the following types of courses: Courses with ME prefix to be selected with student input and approved by the supervisory committee.	
Non-Mechanical Engineering Graduate Courses (0-6)	
Take between 0 and 6 credits from the following types of courses: Non-Mechanical Engineering Graduate Courses	
Culminating Activity	6*
ME593 - Thesis (6-12)* *up to 12 thesis credits may be taken as needed, however only 6 will be counted toward degree requirements	
Grand Total Credits:	30

[1] From the 2024-2025 Graduate Catalog

Masters of Engineering Degree Requirements, Catalog Statement[2]

Course Number and Title	Credits
Mechanical Engineering and Mathematics Core	
Take the following:	4
ME501 - Engineering Professional Development (1) ME510 - Continuum Mechanics (3)	
Take at least 1 of the following:	3
MATH527 - Introduction to Applied Mathematics for Scientists and Engineers (3) MATH536 - Partial Differential Equations (3) MATH537 - Principles of Applied Mathematics (3)	
Take at least 1 of the following:	3
MATH565 - Introduction to Numerical Methods (3) MATH571 - Data Analysis (3) MATH572 - Computational Statistics (3) ME536 - Computational Fluid Dynamics (3) ME570 - Finite Element Methods (3) ME571 - Parallel Scientific Computing (3) OR Another course with a computational emphasis approved by the student's advisor.	
Additional Courses:	20
Mechanical Engineering Graduate Courses (11-20)	
Take between 11 and 20 credits from the following types of courses: Courses with ME prefix to be selected with student input and approved by the supervisory committee.	
Non-Mechanical Engineering Graduate Courses (0-9)	
Take between 0 and 9 credits from the following types of courses: Non-Mechanical Engineering Graduate Courses	
Culminating Activity	1
ME690 - Master's Comprehensive Examination (1)	
Grand Total Credits:	31

[2] From the 2024-2025 Graduate Catalog

How to Obtain your MS ME or MEngr ME Degree: Timeline

Upon admission to one of our Master's programs, students should schedule an appointment with their advisor. If a student has not yet established a relationship with a graduate faculty member (see Appendix), they should meet with the graduate coordinator. Unless other arrangements are made, all Master of Engineering (MEngr) candidates are advised by the graduate coordinator.

While there are many similarities between the MS and MEngr degree requirements, there are significant differences in advising. For MS students, the thesis advisor plays an active role in course selection and provides guidance throughout the research process. Students pursuing the MS degree are strongly encouraged to seek out a thesis advisor as soon as possible after admission to ensure timely progress in their research and coursework.

Masters of Science Program Timeline

The flowchart on the following page outlines a typical two-year course of study for MS students. However, individual circumstances vary, and some deviation from this timeline is expected. Students should work closely with their thesis advisor to develop a plan that aligns with their academic and professional goals while ensuring steady progress toward degree completion. For more information see MS Thesis policy.

Masters of Engineering Program Timeline

The Master of Engineering (MEngr) program is a non-thesis degree, offering two options for the culminating activity:

1. Comprehensive Exam – A traditional written exam taken in the final semester.
2. Project-Based Culminating Activity (PBCA) – A real-world application project demonstrating mastery of mechanical engineering concepts, supervised by a two-person committee.

Unlike the MS program, which requires a thesis and supervisory committee, MEngr students are guided by the department graduate committee or, for PBCA participants, a faculty committee consisting of the ME graduate coordinator and a faculty member with relevant expertise. For more information see MEngr PBCA policy.

Students are strongly encouraged to meet with their advisor early in their final semester to plan for either the Comprehensive Exam or PBCA and ensure they fulfill all necessary requirements. Figure 2 provides a recommended timeline for completing the MEngr degree program.

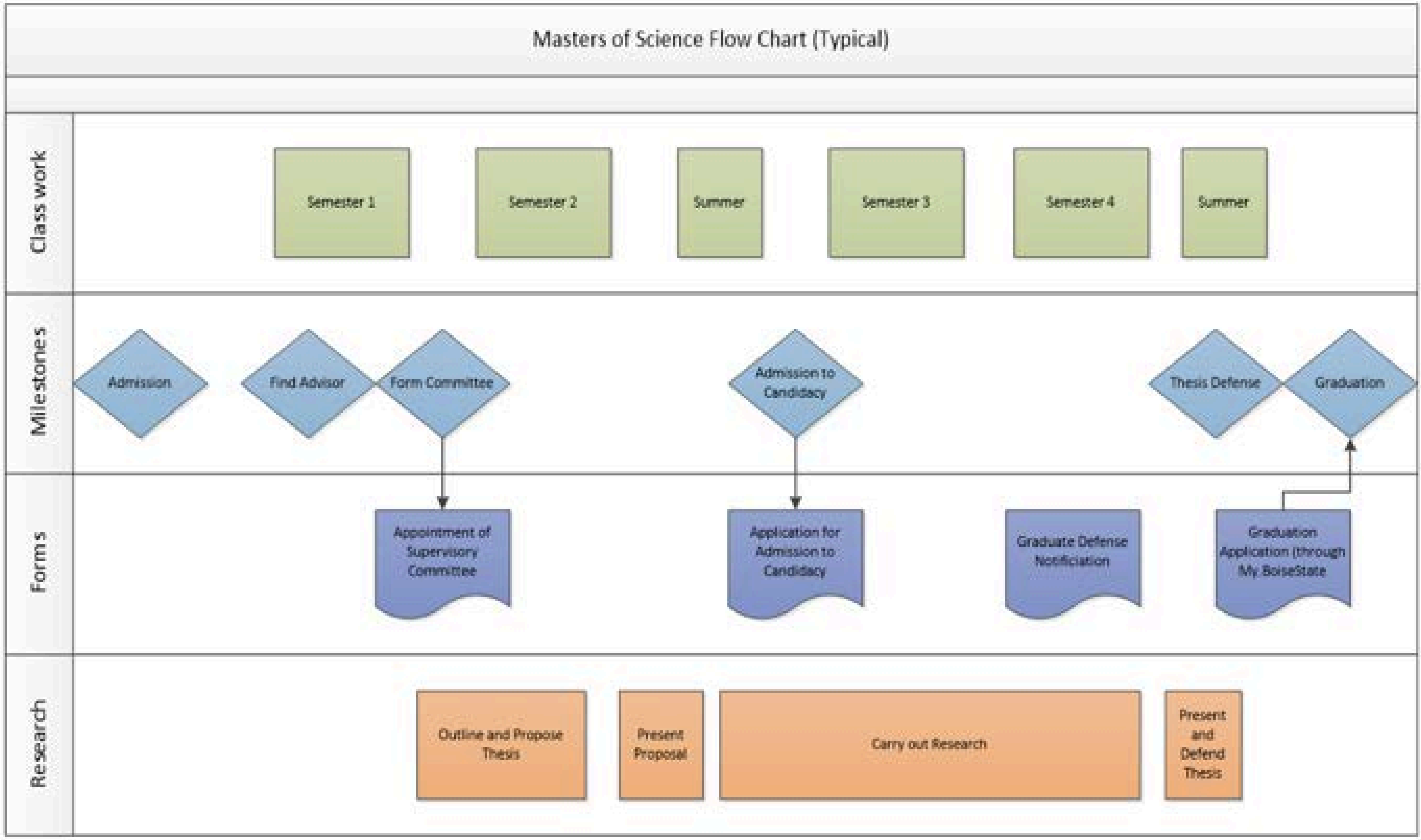


Figure 1: Typical Masters of Science Program Timeline

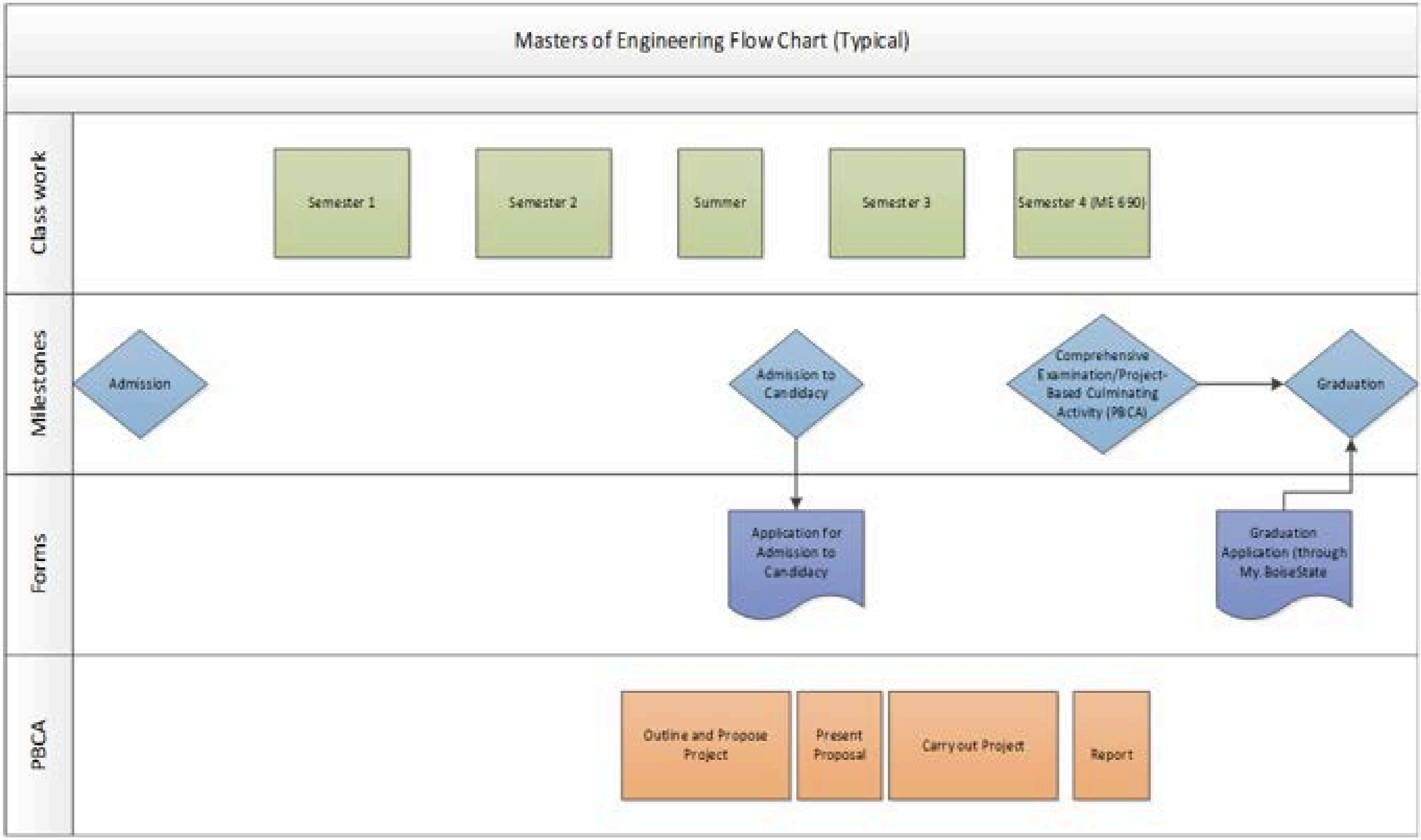


Figure 2: Typical Masters of Engineering Program Timeline

Comprehensive Exam for the Masters of Engineering Program

The graduate program coordinator is responsible for administering the Comprehensive Exam, which is based on three graduate courses taken by the student to fulfill program requirements. The exam process follows these steps:

At the beginning of the final semester, when the student is registered for ME 690: Comprehensive Examination, they will meet with their graduate advisor (typically the graduate coordinator) to select the three courses that will form the basis of the exam. While student preferences may be considered, the graduate committee reserves the right to determine the final selection, and any disagreements on topic selection will be resolved by the department graduate committee. In general, cross-listed undergraduate/graduate courses (400/500-level courses) are not eligible for the comprehensive exam.

The exam date is set by the graduate coordinator, and when multiple students are eligible, efforts will be made to schedule exams at the same time. Typically, the exam is held toward the end of the semester, but if none of the three selected topics correspond to courses the student is currently taking, the exam may be scheduled earlier in the semester.

The exam is typically three hours long, proctored, and open-book. The graduate coordinator will solicit appropriate problems from the faculty who taught the selected courses (or designated faculty surrogates if the original instructor is unavailable). The exam will be administered and proctored by the graduate coordinator, after which the faculty members will evaluate and grade the worked problems.

To pass the comprehensive exam, students must achieve a minimum score of 70% on each of the three sections. If a student does not pass on the first attempt, they will be granted one additional attempt to retake the exam.

The graduate coordinator will notify the student of their exam results once grading is complete.

Comprehensive Exam Timeline and Responsibilities

(Spring Semester Example)

Timeframe	Action	Responsibility
Early January (By class begins)	Students should register for ME 690: Comprehensive Examination.	**Students**
January	Students meet with their graduate advisor to select the three courses for the comprehensive exam	**Students** & Graduate Advisor

By the end of January	Finalize and approve course selections for the exam.	Graduate Committee
By the end of February	Graduate coordinator sets the exam date and informs students and faculty.	Graduate Coordinator
	Coordinate with faculty to avoid scheduling exams on holidays or during Break.	Graduate Coordinator
	Faculty notified of their involvement in the exam and asked to prepare problems.	Graduate Coordinator
By the end of March	Faculty submit exam problems to the graduate coordinator.	Course Lecturers
	Faculty provide details on open/closed book conditions and any reference materials allowed	Course Lecturers
By the end of April	Administration of the comprehensive exam from 1-4 pm.	**Students** & Graduate Coordinator
	Faculty grade the exams and submit results to the graduate coordinator.	Course Lecturers
Early May	Graduate coordinator compiles results and notifies students of their performance before Finals Week.	Graduate Coordinator
Finals Week	Reserve time for potential retakes if necessary.	**Students** & Graduate Coordinator
By Commencement	All retakes completed and final results communicated to students.	Graduate Coordinator

Project-Based Culminating Activity for Masters of Engineering Program

Students choosing the PBCA will work on a real-world application project demonstrating mastery of mechanical engineering concepts. This project is supervised by a two-person committee, including the ME graduate coordinator and a faculty member with relevant expertise. The PBCA consists of a proposal phase, where students submit a written summary and deliver an oral presentation, followed by a final report submission at the end of the project.

It is strongly recommended that students meet with their advisor (typically the graduate coordinator) as early as possible in the semester to begin planning for either the Comprehensive Examination or PBCA and ensure they meet all necessary requirements.

Funding your MS ME Graduate Program/ Graduate Assistantships

Students holding a graduate assistantship (GA) are contractually responsible for conducting research and/or teaching duties in exchange for a stipend and tuition waiver. The duration of a GA varies based on funding availability and are typically reserved for MS students.. Students selected for a GA should discuss their expected responsibilities with their supervisor before formally accepting the position.

There are two primary types of GAs: program-funded GAs, and other GAs.

A **program-funded GA** is a full-time, registered graduate student who is primarily a research assistant in a laboratory and who also assists the MBE department with two teaching responsibilities in the fall and spring semester. If there are available program-funded GA positions, eligible MS students will be notified and given an opportunity to apply.

An **other GA** is a full-time registered graduate student whose role is to assist with research in a laboratory. Other GAs can include research-funded positions with specific faculty members, fellowship funding, or self-funding.

Full time status for financial aid

Students holding GAs must be registered for at least five (5) credit hours to maintain full-time graduate student status. If a GA is appointed during the summer, they are not required to enroll in summer courses but must register for a minimum of five (5) credit hours in the following fall semester. If GAs choose to take summer courses, the tuition waiver is not applied during the summer term.

To ensure timely processing of paychecks and tuition waivers, prospective Research or Teaching Assistants must complete all required paperwork at least one month before the start of their appointment. For further details, students should contact the MBE Administrative Assistant listed on the cover of this manual.

Health Insurance Requirements

The health insurance industry and governmental requirements for coverage have undergone significant changes in recent years. All students are required to maintain health insurance that meets the standards set by the Affordable Care Act (ACA). For questions or further information, students are encouraged to contact Boise State's Student Health Services.

APPENDICES

Appendix A: Graduate Courses in Mechanical & Biomedical Engineering[3]

ME501 Engineering Professional Development (1-0-1)(F). Explores best practices in technical communication of advanced engineering concepts, develops professional skills for career advancement, and increases awareness of engineering ethics. (Pass/Fail.)

ME505 Mechanical Engineering Teaching Experience (1-3-2)(F/S). Provide teaching support in a mechanical engineering class under faculty supervision. Duties may include teaching a lab section, holding office hours, and overseeing projects. Content includes basic pedagogy and teaching skills. (Pass/Fail.)

ME510 Continuum Mechanics (3-0-3)(F/S). Development and analysis of fundamental relationships and constitutive equations for deformation, strain, and stress of materials occupying a continuous domain. Eulerian and Lagrangian methods are covered. Vector and tensor techniques developed. PREREQ: Graduate standing or PERM/INST.

ME520 (KINES520) Advanced Biomechanics (3-0-3)(F). Mechanical principles and analytical methods used in traditional and contemporary biomechanics. Topics include functional anatomy, joint kinematics, inverse dynamics, mechanical properties of biological materials, and modeling of the musculoskeletal system. May be taken for KINES or ME credit, but not both. PREREQ: ENGR220 or PERM/INST.

ME522 Advanced Thermodynamics (3-0-3)(F/S). Advanced topics selected from Statistical Thermodynamics, Thermodynamics of Chemically Reacting Gases, Thermodynamics Property Formulation for Computer Applications and others at the discretion of the professor. PREREQ: ME420.

ME525 (KINES525) Laboratory Techniques in Biomechanics (3-0-3)(S). An introduction to the analysis techniques used to study the mechanics of human motion. Topics include cinematography, videography, force transducers, electromyography and computer analysis techniques. May be taken for KINES credit or ME credit, but not both. PREREQ: KINES520/

[3] From the 2024-2025 Graduate Catalog

ME520 or PERM/INST.

ME526 Renewable Energy Systems (3-0-3)(F/S). A survey of renewable energy systems including solar, wind biomass, as compared to traditional electric power production and distribution. PREREQ: ENGR 240, and CE330.

ME530 Advanced Fluid Mechanics (3-0-3)(F/S). Theory and physics of viscous flows. Conservation laws. Vorticity dynamics and transport. Laminar flows and elementary lubrication theory. Flow instability. Introduction to boundary layer theory and turbulence. Some exact solutions to the Navier-Stokes equations. PREREQ: ME323; ME320 and ME330.

ME532 Acoustics (3-0-3)(F/S). Basic theories of acoustics, wave equations, acoustic response, sound generation, transmission, and attenuation. Measurement techniques and nomenclature. PREREQ: CE330, and MATH333.

ME536 Computational Fluid Dynamics (3-0-3)(F/S). Theory and numerical modeling in fluid dynamics. Finite difference, finite volume, and finite element techniques will be treated. The course will include projects and research applications in engineering and environmental flows. PREREQ: CE330, and PERM/INST.

ME537 Conduction Heat Transfer (3-0-3)(F/S). Steady and unsteady conduction of heat through solids, liquids, and gases. Analytical and numerical solution methods for ordinary and partial differential equations modeling heat transfer. PREREQ: Graduate standing or PERM/INST.

ME538 Convective Heat Transfer (3-0-3)(F/S). Treatment of energy and linear momentum conservation equations; laminar and turbulent forced convective HT in internal and external flow fields; free convection.

ME539 Radiation Heat Transfer (3-0-3)(F/S). Radiation heat transfer due to emission and absorption between surfaces and within materials. Analytical and numerical solutions for steady and unsteady heat transfer due to radiation as a dominant process or in combination with convection and conduction. PREREQ: Graduate standing or PERM/INST.

ME550 Advanced Mechanics of Materials (3-0-3)(F/S). Extension of stress strain concepts to three-dimensions, plate and shell analysis, failure theories, and fatigue. Analysis and visualization techniques include Finite Element Analysis and photoelasticity. PREREQ: CE350.

ME560 Computer Aided Design (3-0-3)(F/S). Computer programs used to develop 3-D CAD database for design, analysis, simulation, and manufacturing. Machinery design to meet functional, performance, reliability and manufacturing requirements. Design projects reinforce concepts and methodologies. For students desiring higher level CAD skills prior to taking ME480.

ME561 (ECE561) Control Systems (3-0-3)(S). Time and frequency domain analysis and design of feedback systems using classical and state space methods. Observability, controllability, pole placement, and observers. May be taken for ECE or ME credit, but not both.

ME567 (ECE564) Robotics and Automated Systems (3-0-3)(F/S). An introduction to robotics with emphasis on automated systems applications. Topics include: basis components of robotic systems; selection of coordinate frames; homogeneous transformations; solutions to kinematic equations; velocity and force/torque relations; manipulator dynamics; digital simulation of manipulator motion; motion planning; actuators of robots; sensors of robots; obstacle avoidance; and control design. May be taken for credit as ECE or ME, but not both.

ME566 Dynamic Modeling and Control of Engineering Systems (3-0-3) (F/S/SU). Multi-physics modeling of lumped parameter systems. Theoretical basis of system response including classical differential equations, state space methods, Laplace and frequency domain approaches. Closed loop stability and overview of SISO control system specification and design. Emphasis on computer simulation and model verification. PREREQ: Graduate standing or PERM/INST.

ME570 Finite Element Methods (3-0-3)(F/S). Theoretical development of finite element methods, solution algorithm formulation, and problem solving in stress analysis, heat transfer, and fluid flow. PREREQ: ENGR 220, and CE350 or ME350, and PERM/INST.

ME571 Parallel Scientific Computing (3-0-3)(F/S). Introduction to parallel scientific and technical computing on supercomputers and modern graphics processing units. Finite difference methods to solve partial differential equations governing heat conduction and wave propagation. Scientific visualization of simulation data. Performance optimization of scientific codes. Course projects involve parallel computer programming of prototype problems. PREREQ: CS117, MATH333, or PERM/INST.

ME574 Advanced Vibrations (3-0-3)(F/S). Theory and applications of vibrating continuous and discrete multi degree of freedom systems, modal analysis, acquisition and synthesis of data. Experimental and analytical characterization of the vibration response of linear and nonlinear systems, including Transfer and Frequency Response Functions, MIMO and SIMO, and mathematical modeling. PREREQ: ME472 or PERM/INST.

ME576 Advanced Dynamics (3-0-3)(F/S). Analytical modeling to predict the performance of linked, multi-body mechanical systems undergoing large displacements and rotations. Theoretical considerations in preparing models for computer simulations and interpreting results. Application of a state of the art computer package in creating realistic simulations. PREREQ: ME380 or PERM/INST.

ME577 (BIOL577)(MSE577) Biomaterials (3-0-3)(F). Theory of biomaterials science. Medical and biological materials and their applications. Selection, properties, characterization, design and testing of materials used by or in living systems. May be taken for BIOL, ME, or MSE credit, but not from more than one department. PREREQ: MSE101 or CHEM112.

ME578 Design and Analysis of Mechatronic Systems (3-0-3)(F/S). Design and analysis of engineering systems containing mechanical, electro-mechanical and embedded computer elements. The course provides an overview of basic electronics, digital logic, signal processing and electromechanical devices. Fundamentals of event-driven programming will also be covered. PREREQ: ENGR 240.

ME582 Optimal Design (3-0-3)(F/S). Analytical and computer methods used to provide optimal design of products or processes. Formulation, specification, figures of merit, controllable variables, constraints and relationships among design variables. Single and multi-variable optimization algorithms using linear and nonlinear programming methods to design problems in structures, machine components, and energy systems. PREREQ: MATH275, PHYS211, and PHYS211L.

ME597 Special Topics (3-0-3)(F/S). Instruction on a topic that is not included in the catalog of regular graduate courses; the topic is indicated by the required modifier. Descriptions for these courses are given in the Schedule of Classes published each semester. Either graded or pass/fail.

ME602 Mechanobiology (3-0-3)(F/S). Describes methods to quantify and predict ways that cells detect, modify, and respond to physical stimulus within the cellular environment. Covers topics in cell biology, statistics, and solid and fluid mechanics with a special emphasis on experimental and computational approaches to model cellular environments and whole cell mechanics. PREREQ: MATH333 or PERM/INST.

Appendix B: Graduate Program Forms and Instructions, ME Policies

Up to date forms can be found at the Graduate college website:

https://www.boisestate.edu/graduatecollege/forms/

When provided, we encourage students to use the electronic versions of the forms.

Links to Electronic Forms frequently used by graduate students

- Forming a thesis committee: Appointment of Supervisory Committee
- Candidacy (Course plan approval): Application for Admission to Candidacy
- Transferring courses from another university: Request for Approval of Transfer Credits
- Exceptions to Degree Requirements: Request for Adjustment of Academic Requirements
- Independent Study: Application for Graduate Independent Study
- Defense Notification – use this online form to notify the Graduate College that a graduate defense has been scheduled and provide details of the presentation for public announcement
- Defense Committee Approval – use this template to prepare the approval page to take to their defense. Requires all committee members' signatures immediately following a successful defense and is then submitted to the Graduate College

When in doubt about the form needed, or the proper preparation and routing of a form, please contact the program graduate coordinator or administrative assistant listed on the cover of this manual.

Links to ME Policies graduate students

- Master's Thesis Policy (MS) – use this document to guide you as you prepare for your Thesis Proposal and Defense.
- Thesis Proposal Approval Form – use this document to indicate that you successfully passed your Thesis Proposal.
- Project-Based Culminating Activity Policy (MEng) – if you're a Master of Engineering student (MEng), use this document if you decide to complete a project-based culminating activity instead of a standard exam-based culminating activity.

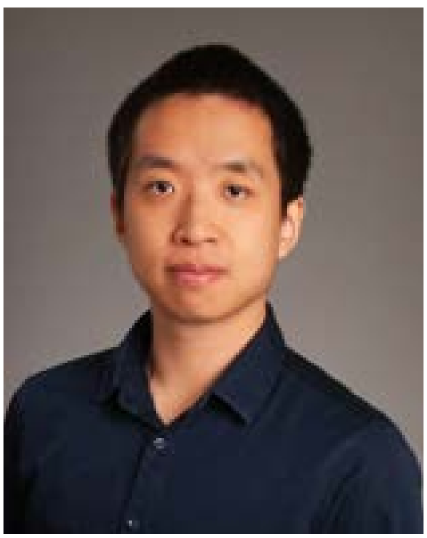
*If you encounter an issue opening or completing any of the forms linked above, please try opening the form in an incognito or private window by right clicking on the link and selecting that option.

Instructions for Filling out the Application for Admission to Candidacy

What is it: The Application for Admission to Candidacy is the process by which we certify that your coursework meets the degree requirements and that you are prepared to carry out thesis research. The process consists of filling out the on-line application form which must be approved by the graduate coordinator and the graduate college.

When to file: By the time you've signed up for your 3rd semester of coursework, you probably have a good idea of what graduate courses you'll be taking to fulfill the requirements of our program. That would be a good time to file your Application for Admission to Candidacy. For Fall admits, that would be April of your 2nd semester. For Spring Admits, October of that year.

Appendix C: Graduate Faculty in Mechanical & Biomedical Engineering

	**Diacong Da** *Assistant Professor* diacongda@boisestate.edu RUCH 235	$(MD)^2$: Mechanics, Design, Manufacturing and Data Digital Design and Automation.
	**Zhangxian (Dan) Deng** *Associate Professor* zhangxiandeng@boisestate.edu RUCH 204	Smart materials and system dynamics.

	**Clare Fitzpatrick** *Associate Professor; BME Ph.D. Program Coordinator* clarefitzpatrick@boisestate.edu RUCH 206	Musculoskeletal Biomechanics and Finite Element Methods. Director of the Computational Biosciences laboratory.
	**Trevor Lujan** *Professor and Chair* trevorlujan@boisestate.edu 208-426-2857 | RUCH 201C	Biomechanics applied to tissue. Director of the Northwest Tissue Mechanics Laboratory.

	**Mahmood Mamivand** *Associate Professor* mahmoodmamivand@boisestate.edu RUCH 232	Multi-scale modeling of materials. Director of the Computational Materials Engineering laboratory.
	**Erin Mannen** *Associate Professor; ME Graduate Program coordinator* erinmannen@boisestate.edu MEC 403B	Biomechanics of infants Director of the Boise Applied Biomechanics of Infants laboratory.
	**Todd Otanicar** *Professor; Interim Associate Dean for Research Affairs* toddotanicar@boisestate.edu GAA 103	Thermo, Solar Energy. Director of the Thermal Transport and Solar Energy Laboratory.

	**Krishna Pakala** *Associate Professor* krishnapakala@boisestate.edu RUCH 203	Engineering Education, Thermal-Fluids.
	**Aykut Satici** *Associate Professor* aykutsatici@boisestate.edu RUCH 233	Robotics, dynamical systems, and control. Director of the Robot Control laboratory.
	**Sophia Theodossiou** *Assistant Professor* SophiaTheodossiou@boisestate.edu MEC 403E	Musculoskeletal Tissue Engineering, Stem Cell Mechanobiology, Natural and Synthetic Biomaterials, 3D in vitro Models of Musculoskeletal Development and Disease, 3D Printing and Bioprinting

	**Gunes Uzer** *Associate Professor* gunesuzer@boisestate.edu RUCH 205	Cellular level mechanics for regenerative medicine. Director of the Mechanical Adaptations laboratory.
	**Anamaria Zavala** *Assistant Research Professor* anamariazavala@boisestate.edu MEC 403A	Mechanical regulation of chemotherapy side effects. Dynamic Nuclear Adaptations Laboratory

Appendix D: Research Labs

Boise Applied Biomechanics of Infants (BABI) Laboratory 	**Director: Erin Mannen, Ph.D.** Yanke Research Park, 220 E. Parkcenter Blvd., Boise, ID 83706 ErinMannen@boisestate.edu The BABI Lab at Boise State University focuses on understanding how babies move and use their muscles, and what that means for safety and musculoskeletal development. We work closely with clinicians and industry to ask relevant questions to improve the health and well-being of babies.
Computational Biosciences Laboratory (CBL) 	**Director: Clare Fitzpatrick, Ph.D.** Micron Engineering Center, Room 402 clarefitzpatrick@boisestate.edu Research at the CBL focuses on applying computational models to understand the mechanisms of disease, injury and degeneration, and designing targeted treatment options and surgical interventions to address clinical issues and athletic performance. We work in close collaboration with surgeons and experimentalists to gather data to develop and validate our models, and then use these models to predict how the body will behave during different activities, or how it may change as a result of injury or surgical intervention. The overall objective of this work is to improve quality of life and functional performance.

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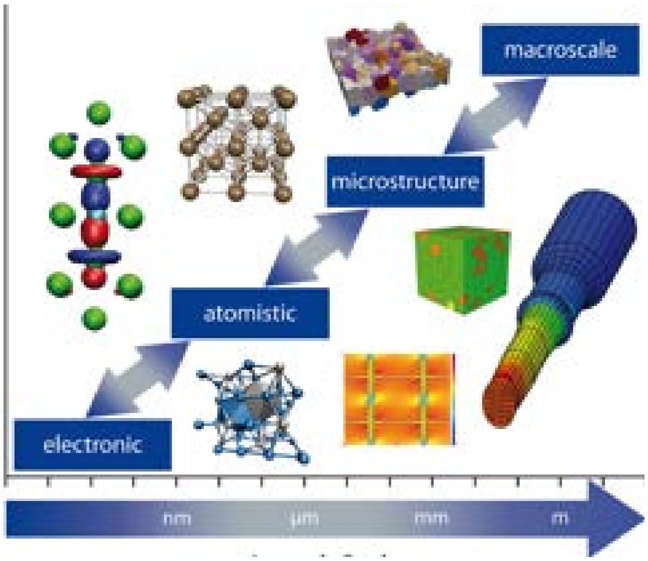
Computational Materials Design (CMD) Laboratory



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Director: Mahmood Mamivand, Ph.D.
Micron Engineering Center, Room 408
mahmoodmamivand@boisestate.edu

At the CMD lab we develop physics-based and data-driven models to understand the inter-relationships between chemistry, processing, structure, and property in materials. The goal of the CMD group research is to accelerate the process of materials design and discovery through advancing the science and engineering of materials microstructure. Our research covers a wide range of materials including aerospace materials, energy materials, and biomaterials.

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Energizing Engineering Education (E3) Laboratory

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Director: Krishna Pakala, Ph.D.
RUCH 203
krishnapakala@boisestate.edu

The E3 lab is focused on engineering education research serving as an engine to explore novel classroom techniques that can help the professional formation of engineers through understanding of the formal and informal education and value systems by which people become engineers. Our lab's research focus is in innovative teaching and learning strategies, use of emerging technologies, and mobile teaching and learning strategies. Our lab's goal is to transform engineering education to support student success inside and outside the classroom, by developing evidence-based, practical approaches that can be widely adopted by the engineering education community.

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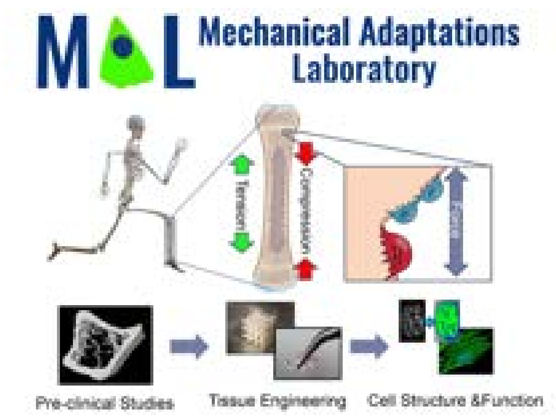
<td>Mechanical Adaptations Laboratory (MAL)

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<td>Director: Gunes Uzer, Ph.D.
Micron Engineering Center, Room 313
gunesuzer@boisestate.edu

Studies in MAL are directed towards understanding how changes in the tissue mechanical environment in relation to exercise, injury, aging and disuse regulate structural adaptations in cells to control signaling and eventually fate decisions in stem cells.</td>
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<td>Northwest Tissue Mechanics (NTM) Laboratory
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<td>Director: Trevor J. Lujan, Ph.D.
Micron Engineering Center, Room 314
NTM@boisestate.edu

A core focus of the NTM laboratory is to investigate how biological tissue responds to force during injury and repair, and to then translate this research into innovative medical solutions that are effective, practical and affordable. Our research utilizes experimental and computational methods, and we engage in interdisciplinary collaborations with biologists, engineers and clinicians.</td>
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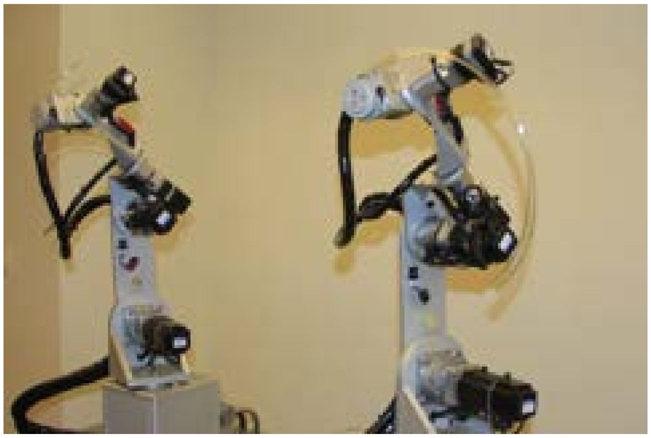
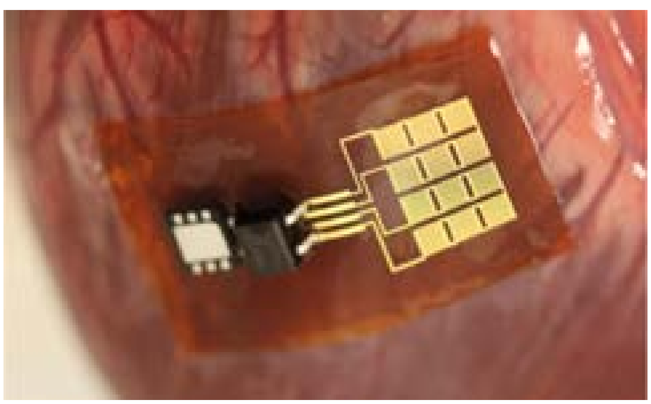
Robot Control Laboratory (RCL) 	**Director: Aykut C. Satici, Ph.D.** Micron Engineering Center, Room 103 aykutsatici@boisestate.edu The mission of the RCL is to enable robots to efficiently and robustly perform desired manipulation and locomotion tasks by designing low-level feedback control and estimation algorithms. This avenue of research lies in the intersection of dynamical systems, robotics, control, and applied mathematics. A core focus of our laboratory is to investigate how to perform manipulation with multi-agent robotic systems, devising robustly stabilizing controllers for hybrid mechanical systems, such as robots in intermittent contact with the environment. Our research is theoretical and experimental and we engage in interdisciplinary collaborations with biologists (bio-inspired robotics), engineers, and mathematicians.
Smart Materials and Systems (SMS) Laboratory 	**Director: Zhangxian "Dan" Deng, Ph.D.** Micron Engineering Center, Room 305 zhangxiandeng@boisestate.edu The overall objective of the SMS Lab is to investigate the potential of advanced smart materials in structural health or human health monitoring. The on-going projects cover both fundamental research and applied research. The fundamental research includes Multiphysics modeling and experimental characterization of new smart materials. The applied research involves wireless sensor development and mechanical energy harvesting. Future projects will target the integration of smart materials and novel 2D/3D printing technologies.

Thermal Transport and Solar Energy (TTSE) Laboratory 	**Director: Todd Otanicar, Ph.D.** Micron Engineering Center, Room 210 toddotanicar@boisestate.edu The TTSE Lab is focused on the intersection of thermal and mass transport with a variety of different energy systems. Our research has investigated radiative properties of nanoparticles, erosion in high temperature environments, desalination, and the design of hybrid thermal/photovoltaic solar collectors.
Center for Orthopaedic and Biomechanics Research (COBR) 	Yanke Research Park, 220 E. Parkcenter Blvd., Boise, ID 83706 (208) 426-5614 cobr@boisestate.edu COBR is a partnership between the Department of Mechanical and Biomedical Engineering and the Department of Kinesiology. The mission of COBR is to advance understanding of the mechanical and neuromuscular characteristics of human movement through basic science, engineering, clinical research and education.

Theodossiou Lab	**Director: Sophia Theodossiou, Ph.D.** sophiatheodossiou@boisestate.edu The Theodossiou Lab will use natural and synthetic biomaterials along with human and non-human stem cells to develop 3D models of musculoskeletal development and disease, with the ultimate goal of regenerating musculoskeletal tissues following injury or disease. Research in the Theodossiou lab combines engineering, biology, and materials science to understand how mechanical and biochemical signals drive musculoskeletal development, maturation, and disease. We will use various materials and custom, 3D printed bioreactors and scaffolds to understand how biomechanical cues can be harnessed to regenerate and repair musculoskeletal tissues.
Da lab 	**Director: Daicong Da, Ph.D.** daicongda@boisestate.edu Da's lab research is committed to the progress of structural and materials engineering that contributes to energy conservation and overall quality of life. Through an interdisciplinary approach combining computational and experimental research, we explore the complex interplay between mechanics, materials, design, and data science. By investigating different physics and length scales, we enable multifunctional materials and structures with dramatically improved or entirely new properties.. Our work requires a comprehensive understanding of material and structural behavior in different scenarios to design new ones using new properties and manufacturing processes.