The course grade will be based on five criteria: homework/quizzes (20%), in-class biomechanical technique presentation (10%), mid-term exam (20%), term project (25%), and final exam (25%).

Homework will be assigned at the end of many class lectures, and will be due at the beginning of the next class lecture unless otherwise noted. Each assignment is designed to reinforce the student’s understanding of the material presented in class. The homework assignments are designed to take about an hour to complete (on average), but the format will vary considerably, depending on the context of the lecture material. For example, some assignments will involve problems requiring numerical calculations or brief quantitative analyses. Others will involve verbal responses to conceptual questions, and yet others will require concise summaries of portions of the lecture material. Each assignment will be graded on a scale of 1 to 10, and all will be weighted equally. A few brief in-class quizzes will also be given, and each will be weighted equivalently to a homework assignment.

Early in the semester, each student is required to make an in-class presentation on a contemporary measurement/analysis technique used in orthopaedic biomechanics. Topics will be assigned by the instructor. A written summary of the presentation is also required. The presentation grade will be based both on content and presentation clarity.

A closed-book mid-term examination, one hour in length, will be given to test the student’s grasp of the material presented in the first half of the course. The final examination (also closed-book) will be two hours in length, and will be comprehensive for the entire course. Both examinations will involve questions in a variety of formats.

The term project will consist of a thoroughly researched paper involving the student’s idea for a new or modified orthopaedic implant. The term projects are due on the last day of class, and are to be done individually. The papers are limited to a length of 20 pages double-spaced (10 point font or larger), including references and figures. For the term project, the student takes on the hypothetical role of a staff R&D engineer in a company that manufactures orthopaedic devices. He or she is required to identify an area in which the company can develop and market a new product, and must present a plan to convince management to invest resources to that end. The new product can involve any of the areas covered in the course (or others, with instructor consent), but it must be a product whose design involves a substantial degree of mechanical analysis. Examples might be a new peg arrangement to reduce tilting of a total knee replacement, or an improved fixation device to better stabilize a particular type of fracture. The paper should (1) identify the specific problem area; (2) critically review the limitations of any existing devices; (3) clearly describe the new idea; (4) present an appropriate biomechanical analysis to convince management that the innovation “will work”; (5) outline potential pitfalls to successful development; and (6) estimate the financial and logistical resources required to bring the concept to fruition.