

Physics 222 Lab Manual

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A Note to the Instructor

This manual is written in a style sometimes referred to as “guided instruction”. Much of what students need to know to perform the various measurements is contained in this manual. However, it is the intention of the authors that this manual be used in a laboratory classroom in which there is continuous interaction among the students using the manual, and between these students and an instructor who is prepared to discuss the measurements, analysis and concepts involved in the experiment. Without these interactions between students, and between students and a talented teacher, the benefits that students derive from these materials are likely to be significantly reduced. It is a prime responsibility of the instructor to foster these interactions continuously.

This manual was written at Iowa State University for use in Physics 222, the second semester of a two-semester sequence in Introductory Physics, Physics 221 and 222. This sequence is commonly referred to as an “calculus-based physics sequence”, and consists of two 5-credit courses. These courses consist of three lectures and two small classes per week. For Physics 222, the small classes consist of one recitation and one laboratory class. Each semester consists of 15 weeks of instruction plus one week of final exams. These two courses are designed to be taken as a sequence and not in isolation. In particular, Physics 221 is not designed to be taken without being followed by Physics 222. This sequence or its equivalent is a pre-requisite for most higher-numbered courses offered by the department. The annual enrollment in Physics 222 is approximately 900 students. The great majority of these students are majoring either in engineering, computer science or one of the physical sciences. The laboratory room serves up to 24 students working in pairs at 12 tables; each laboratory class period is 110 minutes long.

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