OBJECTIVES OF THE PHYSICS P201 COURSE (from Information Sheet distributed to students in Spring 1994)

Physics is concerned with the creation of theories or models (based on and tested by experiments) to account for the behavior of nature. Such accounts attempt to "predict or explain the maximum number of observable phenomena on the basis of the minimum number of basic premises." The current world view of nature is to a large extent contained in just four theories containing a total of only eleven laws or equations: Newtonian mechanics (Newton’s three laws), thermodynamics (three laws) and statistical mechanics, electromagnetism (Maxwell’s four equations), and quantum mechanics (Schroedinger’s equation).

The primary objective of the present P201 course is to help you ASCEND TO THE NEWTONIAN WORLD by achieving (a) a thorough understanding of the basic concepts of Newtonian mechanics (including wave phenomena), (b) the ability to apply this understanding to the solution of physical problems. The latter capability will be enhanced by a problem-solving emphasis on critical thinking and effective problem-solving strategies as used by scientists and as emphasized in the research-based course materials: the Reif Text & Workbook and the Socratic Dialogue Inducing Lab Manual.

The focus of the present course, as stated above, should help to prepare you for admission exams to professional and graduate schools. These exams increasingly emphasize conceptual understanding, problem solving, and critical thinking rather than mere regurgitation of memorized factual material. There is a growing realization that personal satisfaction and career success in a world of rapid change and vast electronic data banks will depend more on your ability to ask questions, think, learn new things, and understand concepts than on your memory capacity. Some material (e.g., solids and fluids, fluids in motion, thermodynamics, and sound in Chapters 9--13, 15 of the secondary text by Serway and Faughn) which sometimes appears on standardized tests such as the MCAT will not be covered in P201-2. However, such topics should be relatively easy for you to learn on your own if you understand the basic concepts and learning strategies emphasized in P201-2.

Experience has indicated that most students attain conceptual understanding and problem-solving ability only by interactive engagement with (not passive absorption of) course material: (a) active study of texts and workbooks, (b) drawing a labeled diagram and then working out as many problems as possible, (c) vigorous participation in lectures and demonstrations, (d) dynamic involvement in discussions and laboratories, (e) diligent study and discussion of physics with instructors and student colleagues. In order to learn physics it is essential that you take responsibility for your own learning and not regard yourself as a passive receptacle into which physics knowledge is to be poured.
P201 ACADEMIC BACKGROUND QUESTIONNAIRE (Spring 1995, R.R. Hake & R. Van Kooten)

NAME ___________________________________ _________________________ ______  ______  ______

LAST (Print Clearly)                              First (Print Clearly)                          ID Number ______

Class (Encircle One): Freshman; Sophomore; Junior; Senior; Graduate; Non-degree; Other (specify)__________

I. HIGH SCHOOL (Please place a check____ AFTER those you HAVE completed.

A. Algebra____; B. Geometry____; C. Trigonometry____; D. Analytic Geometry____; E. Calculus____;
F. Other Math Courses (Specify)________________________________________________________________;
G. Biology____; H. Chemistry____; I. Physics____ at _________ High School in (town&state) ________________
Physics taught by (teacher’s name)________________________________; J. Geology (or Earth Sciences)___;
K. Astronomy____; L. Other Sciences (Specify)_____________________________________________________
Comments (e.g., please indicate AP, ACP, research projects, quality of courses, etc.)_______________________
___________________________________________________________________________________________.

II. UNIV. SCIENCE COURSES COMPLETED (at IU give No. or title, elsewhere give title & Univ.)

A.  Physics_________________________________________________________________________________
B.  Chemistry _______________________________________________________________________________
C.  Biology _________________________________________________________________________________
D.  Computer Science___________________________________________________________________________
E.  Geography _______________________________________________________________________________
F.  Geology ________________________________________________________________________________
G.  Psychology ______________________________________________________________________________
H.  Environmental Studies _____________________________________________________________________
I.  Engineering ______________________________________________________________________________
J.  Other Sciences (Specify) ___________________________________________________________________
Comments ___________________________________________________________________________________
___________________________________________________________________________________________.

III. UNIV. MATH COURSES (Please place a check___AFTER those you HAVE completed.)

A.  M014 Basic Algebra___; B. M110 Excursions into Math___; C. M118 Finite Math___;
D. M119 Survey Calculus I___; E. M120 Survey Calculus II___; F. M125 Pre-Calculus___; G. M126 Trig___;
H. M215 Calculus I___; I. M216 Calculus II___; J. M217 Accelerated Calc.___; K. K300 Statistics___;
L. M301 Linear Algebra___; M. M303 Linear Algebra___; N. K310 Statistics___; O. M311 Calculus III___;
P. M312 Calculus IV___; Q. Other Math Courses at IU (Specify)_____________________________________
__________________________________________________________________________________________.
R.  Math Courses Elsewhere (specify title & Univ.)__________________________________________________
___________________________________________________________________________________________.
Comments__________________________________________________________________________________
___________________________________________________________________________________________.

IV. SOME QUESTIONS (Please use the back of this sheet if you need more room.)

A. What is your major (or intended major)?________________________________________________________.
B. Are you headed for a Professional or Graduate School? Yes___; Maybe___;No___; Other (specify)______
   1. If "Yes" or "Maybe," what type? Medical___; Dental___; Physical Therapy___; Medical Technology___;
      Sports Medicine___; Optometry___; Computer Science___;Chemistry___;Biology___; Botany___; Law___;
      Business___; Other (specify)__________________
C. What minimum grade do you think you need to achieve in P201? (Encircle) A  B  C  D  F   Any
D. Are you left handed? No__;Yes__; If "yes," do you prefer a "left-handed seat" for exams? No__;Yes__.
E. Are you color-blind?No__;Yes__; If "yes," which colors can you not discriminate?________________________
F. Are you male or female? Male__; Female__.
G. Do you have other comments? If so, please write them below (or on the back of this sheet):

NOTE: TO AVOID AN "F" IN P201 YOU MUST HAND THIS IN BY 5 PM, WED., 18 JAN., 1995.
GAG: Grading Acronym Guide (R. R. Hake, 1/14/94)

A. Usually Automatic One Point Off
   ND  No Diagram
   NDC Not Dimensionally Correct
   NF  No Formula
   NR  Non Reduction of answer to simple one-number form
   PA  Physically Absurd (as $m_{\text{ball}} = 1.8 \times 10^{46}$ kg)
   U   Units (missing or erroneous)
   NPI No Plug In (of numerical values in a problem asking for a numerical answer)

B. May Receive Zero Credit (even if answer is correct)
   NJ  No Justification
   RNWP Right Number Wrong Physics
   BPI Blind Plug In (No apparent physical understanding)

C. Poor Technique or Lack of Understanding
   NMD No Meaningful Diagram
   BD  Bare Decimal (write "0.12", not ".12")
   UGH Ugly, Ghastly, Horrible
   MA  Mathematically Absurd
   UVF Use Vertical Fractions (esp. in doing unit cross-outs)
   VTOP Vector Tails On Point
   VTOB Vector Tails On Body
   DDTD Don't Draw Tiny Diagrams
   UCS Use Color Code
   VHA Vertical and Horizontal Axes
   SFAB Subscript Force on body A by body B
   CINW Come Into the Newtonian World
   ZEZEK Zero Effort Zero Knowledge (pronounced "zeek" like geek)
   LAA Learn About Algebra
   LAU Learn About Units
   LAVD Learn About Vector Diagrams
   LAPT Learn About Powers of Ten
   LASF Learn About Significant Figures
   LAE Learn About Equations
   LAM Learn About Mechanics

D. You Get a Break
   WBC Wrong But Consistent (You may get near full credit if your
   ONLY mistake was to substitute a wrong answer from an
   earlier part of a problem)