The GRE® Physics Test

We invite you to take a closer look…

Does your graduate department require or recommend that graduate applicants take the GRE® Physics Test?

This test can be very useful in distinguishing among candidates whose credentials are otherwise similar. The test measures undergraduate achievement and provides a common yardstick for comparing the qualifications of students from a variety of colleges and universities with different standards. Consider these factors:

Predictive Validity

Subject Test scores are a valid predictor of graduate school performance, as confirmed by a meta-analysis performed by independent researchers who analyzed over 1,700 studies containing validity data for GRE tests.[1] This study showed that *GRE*® Subject Tests are reliable predictors of a range of outcome measures, including first-year graduate grade-point average, cumulative graduate grade-point average, comprehensive examination scores, publication citation counts, and faculty ratings. For more information about the predictive validity of the GRE tests, visit www.ets.org/gre/research.html.

Content That Reflects Today's Curricula

The test consists of approximately 70 multiple-choice questions, some of which are grouped in sets and based on such materials as diagrams, graphs, experimental data, and descriptions of physical situations. The test content reflects the relative emphases placed on these topics in most undergraduate curricula, as determined by a content representativeness survey. There is increased emphasis on the understanding of fundamental theoretical principles of physics. A summary of test topics can be found on the back of this sheet. Additional information about the test and a full-length practice test are provided FREE and can be downloaded at www.ets.org/gre/subject/prepare.

Developed by Leading Educators in the Field

The content and scope of each edition of the test are specified and reviewed by a distinguished team of undergraduate and graduate faculty representing colleges and universities across the country. Individuals who serve or have recently served on the Committee of Examiners are faculty members from the following institutions:

- Baylor University
- Beloit College
- Black Hills State University
- Brandeis University
- Carnegie Mellon University
- Drexel University
- Morgan State University
- Temple University
- Union College
- Valencia College

Committee members are selected with the advice of the American Association of Physics Teachers and the American Physical Society.

Test questions are written by committee members and by other subject-matter specialists from colleges and universities across the country.

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[1] Source: "A comprehensive meta-analysis of the predictive validity of the Graduate Record Examinations®: Implications for graduate student selection and performance." Kuncel, Nathan R.; Hezlett, Sarah A.; Ones, Deniz S., Psychological Bulletin, January 2001, Vol. 127(1), 162-181.

For more information about the *GRE*® Physics Test, visit www.ets.org/gre/test-takers/subject-tests/about.html.

Test Content

1. Classical Mechanics 20%

(such as kinematics, Newton's laws, work and energy, oscillatory motion, rotational motion about a fixed axis, dynamics of systems of particles, central forces and celestial mechanics, three-dimensional particle dynamics, Lagrangian and Hamiltonian formalism, non-inertial reference frames, elementary topics in fluid dynamics)

2. Electromagnetism 18%

(such as electrostatics, currents and DC circuits, magnetic fields in free space, Lorentz force, induction, Maxwell's equations and their applications, electromagnetic waves, AC circuits, magnetic and electric fields in matter)

3. Optics and Wave Phenomena 8%

(such as wave properties, superposition, interference, diffraction, geometrical optics, polarization, Doppler effect)

4. Thermodynamics and Statistical Mechanics (10%)

(such as the laws of thermodynamics, thermodynamic processes, equations of state, ideal gases, kinetic theory, ensembles, statistical concepts and calculation of thermodynamic quantities, thermal expansion and heat transfer)

5. Quantum Mechanics 13%

(such as fundamental concepts, solutions of the Schrödinger equation [including square wells, harmonic oscillators and hydrogenic atoms], spin, angular momentum, wave function symmetry, elementary perturbation theory)

6. Atomic Physics 10%

(such as properties of electrons, Bohr model, energy quantization, atomic structure, atomic spectra, selection rules, black-body radiation, x-rays, atoms in electric and magnetic fields)

7. Special Relativity 6%

(such as introductory concepts, time dilation, length contraction, simultaneity, energy and momentum, four-vectors and Lorentz transformation, velocity addition)

8. Laboratory Methods 6%

(such as data and error analysis, electronics, instrumentation, radiation detection, counting statistics, interaction of charged particles with matter, lasers and optical interferometers, dimensional analysis, fundamental applications of probability and statistics)

9. Specialized Topics 9%

Nuclear and Particle physics (such as nuclear properties, radioactive decay, fission and fusion, reactions, fundamental properties of elementary particles), Condensed Matter (such as crystal structure, x-ray diffraction, thermal properties, electron theory of metals, semiconductors, superconductors), Miscellaneous (such as astrophysics, mathematical methods, computer applications)