



Physics Educational Resources

منابع آموزشی فیزیک

عزیزاله شفیعی خانی

دانشکده فیزیک

بهار ۱۴۰۳

اهمیت موضوع

- **تعامل بیشتر:** منابع تکمیلی مانند شبیه‌سازی‌ها و ویدئوها می‌توانند یادگیری را جذاب‌تر و لذت‌بخش‌تر کنند.
 - **پشتیبانی از سبک‌های یادگیری متنوع:** دانشجویان مختلف، سبک‌های یادگیری متفاوتی دارند. منابع تکمیلی می‌توانند به نیازهای یادگیری بصری، شنیداری و حرکتی پاسخ دهند.
 - **تشویق به کاوش:** مواد آموزشی اضافی می‌توانند دانشجویان را تشویق کنند تا موضوعات مورد علاقه خود را به طور عمیق‌تری کاوش کنند، که این امر عشق به یادگیری و کنجکاوی را تقویت می‌کند.
 - **کمک به دانشجویان نیازمند آموزشی:** دانشجویانی که به کمک اضافی نیاز دارند می‌توانند از منابعی که مشکلات تمرینی، راه‌حل‌های گام به گام و مواد مروری ارائه می‌دهند، بهره‌مند شوند.
 - **به‌روز نگه داشتن محتوا:** فیزیک یک رشته با پیشرفت سریع است. منابع تکمیلی می‌توانند به حفظ به‌روز بودن به محتوای دوره با آخرین کشفیات و فناوری‌ها کمک کنند.
- به طور کلی، استفاده از منابع مختلف تکمیلی می‌تواند تجربه و نتایج آموزشی دانشجویان فیزیک را به طور قابل توجهی بهبود بخشد.**

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منابع آزاد آموزش فیزیک

- 1. The Physics Classroom:** Interactive simulations, tutorials, and articles covering a variety of physics topics. Help students grasp complex concepts in a user-friendly format.
- 2. MIT BLOSSOMS:** 2000 physics resources, including activities, worksheets, games, lesson plans, puzzles, posters, presentations, assessments, and other ideas for high school students.
- 3. MIT OpenCourseWare – Physics:** Free lecture notes, exams, and videos from MIT.
- 4. Institute of Physics (IOP):** IOPSpark, over 2,000 free physics teaching resources including classroom-ready material, teaching guidance, video content, and student worksheets.
- 5. PhET Interactive Simulations:** Free science and math simulations for teaching STEM topics, including physics, chemistry, biology, and math, from the University of Colorado Boulder.

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- 6. HyperPhysics:** Concepts in physics, utilizing concept maps and other linking strategies to facilitate smooth navigation.
- 7. aPlusPhysics:** Offering video tutorials, practice problems, and study guides.
- 8. AllaboutCircuits:** Focused on electronics, understanding the physics of circuits.
- 9. Khan Academy Physics:** Free online collection of physics videos and practice exercises.
- 10. PhysicsWorld.com:** News, views, and information for the global physics community.
- 11. PhysicsForums.Com:** A community of scientists, students, and enthusiasts who discuss physics topics.

Lecture notes دست‌نوشته‌های درس‌های فیزیک

- 1. Physics Galaxy:** Free online physics lectures, courses, and video lectures.
- 2. Cambridge Lecture Notes in Physics:** Informal lecture notes, theoretical and experimental physics for graduate students and researchers.
- 3. Physics Notes Online:** Physics notes that cover a wide range of topics, from classical mechanics to modern physics.
- 4. The Feynman Lectures on Physics:** The complete set of lectures by Richard P. Feynman.
- 5. Physics Stack Exchange:** A question and answer site for active researchers, academics, and students of physics and astronomy.

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- 6. Socratic Physics:** A collection of explanations for physics topics, created by a community of physics educators.
- 7. Paul's Online Math Notes:** Focuses on mathematics, notes on physics topics relevant to calculus students.
- 8. Essential Graduate Physics:** Lecture notes and problems on four core physics courses by K. Likharev, covering Classical Mechanics, Classical Electrodynamics, Quantum Mechanics, and Statistical Mechanics.
- 9. Physics 160 Lecture Notes - Harvard University:** Advanced topics for high-level undergraduate or introductory graduate classes, focusing on quantum foundations.
- 10. SlideShare:** SlideShare is a PowerPoint presentation platform where educators and professionals share presentation slides on various topics, including physics.

اپت‌های آموزشی فیزیک **Physics Applets**

- 1. University of Texas at Austin Physics Applets:** Physics applets for real-time imagery in class.
- 2. Physics Applet Resources - WJEC:** Physics applets, including those from the Molecular Expressions, which are popular for their interactive and fun approach to physics concepts.
- 3. Math, Physics, and Engineering Applets - Falstad:** Applets related to math, physics, and engineering.
- 4. PhET Interactive Simulations:** Developed by the University of Colorado Boulder, PhET provides free science and math simulations, and physics through the game-like environment.
- 5. Fowler's Physics Applets - University of Virginia:** Physics applets created for Dr. Michael Fowler's physics courses. These applets provide a visual understanding of physical phenomena.

تکالیف و پرسش‌های آزمون‌های فیزیک Homeworks and Exams

- 1. SigmaOS:** Textbooks, resources, study groups, and practice exams.
- 2. Physics Exams:** Enhance understanding of fundamental concepts and mathematical principles in physics.
- 3. GCSE Physics Online:** Working through lessons or independently at home, including answers and video explanations.
- 4. The Physics Classroom:** Multiple choice and free-response quizzes and tests that target concepts discussed on their website.
- 5. Physexams:** Over 500 solved physics homework and exam problems.
- 6. Aralia:** Videos and practice questions.
- 7. Save My Exams:** Past papers and questions for various exam boards and qualification levels.
- 8. Ready IB:** Resource question banks and revision sheets.

Physics News اخبار فیزیک

- 1. SciTechDaily - Physics News & Research Discoveries:** Offers physics news and recent research articles on quantum physics, astrophysics, geophysics, biophysics, nuclear, and particle physics.
- 2. NewsNow - Physics News:** Physics news aggregated from over 14,000 sources from around the world.
- 3. Phys.org - Physics News:** News in physics, materials science, quantum physics, optics and photonics, and superconductivity science and technology.
- 4. Science News - Physics:** The latest news in materials science, quantum physics, particle physics, and more.

- [arXiv.org](https://arxiv.org)
- [researchGate](https://www.researchgate.net)

- libgen.rs
- free-ebook.net
- infobooks.org
- archive.org
- freebookcentre.net

سرگرمی‌های فیزیک *Funs in Physics*

- 1. The Physics Classroom:** Interactive and multi-dimensional resources for learning physics an engaging and enjoyable experience. It's designed to serve students, teachers, and classrooms with a variety of needs.
- 2. PhET Interactive Simulations:** Free science and math simulations for teaching, including physics. These simulations from the University of Colorado Boulder are fun, interactive, and educational.
- 3. MIT BLOSSOMS:** 2000 physics resources, including activities, worksheets, games, lesson plans, puzzles, posters, presentations, assessments, and other ideas.
- 4. Science Buddies - Physics STEM Activities for Kids:** Physics experiments and activities that uncover the laws of the universe in a fun and educational way
- 5. NSF - National Science Foundation Physics Classroom Resources:** Features resources such as “Ball in a Funnel: Little Shop of Physics” and “The Physics of Animation: Science Nation,” which are designed to make physics concepts accessible and entertaining.

History of Physics تاریخ فیزیک

Ancient and Classical Physics

Scientific Revolution

19th Century

20th Century Transformations

Modern Physics

سایت‌های فارسی

- mamwad.org
- psi.ir
- gammajournal.ir
- maktabkhooneh.org
- physicfa.ir
- fradars.org
- alaatv.com