CU Modern Physics Curriculum

Indicates a research-demonstrated benefit

Overview

Curriculum for large-lecture modern physics class for engineering majors. Focus on reasoning development, model building, and real-world applications.

Type of Method	Full curriculum, Curriculum supplement, Tutorials, Computer simulations
Level	**Designed for:** Intermediate **Can be adapted for:** Teacher Prep Course, Teacher Professional Development, High School, Intro College Calculus-based, Intro College Algebra-based, Intro College Conceptual, Upper-level Undergraduate, Graduate School
Setting	**Designed for:** Lecture - Large (30+ students) , Homework **Can be adapted for:** Lecture - Small (<30 students), Recitation/Discussion Session, Lab, Studio
Coverage	Many topics with less depth
Topics	Modern / Quantum
Instructor Effort	Medium
Resource Needs	Projector, Computers for students
Skills	**Designed for:** Conceptual understanding , Making real-world connections , Problem-solving skills, Using multiple representations **Can be adapted for:** Lab skills, Metacognition
Research Validation	**Based on research into:** theories of how students learn , student ideas about specific topics **Demonstrated to improve:** conceptual understanding , beliefs and attitudes **Studied using:** student interviews , classroom observations , analysis of written work , peer-reviewed publication

Compatible Methods	Peer Instruction, PhET, JiTT, CGPS, Physlets, SCALE-UP, OSP, Thinking Problems, LA Program, CAE TPS, New Model Course, CPU, TEFA, CU QM, QuILTs, Paradigms, PI QM, Tutorials, Clickers
Similar Methods	New Model Course, CU E&M, CU QM
Developer(s)	Carl Wieman, Kathy Perkins, Sam McKagan
Website	http://per.colorado.edu/modern
Intro Article	5247
Intro Article	Reforming a large lecture modern physics course for engineering majors using a PER-based design

Teaching materials

You can download all course materials, including lecture slides, clicker questions, homework, exams, and solutions from the developer's website (you'll need to ask for a password to access solutions): http://per.colorado.edu/modern