



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>