



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>