



## CU upper-division QM curriculum

 Indicates a research-demonstrated benefit

### Overview

Supplementary activities for upper-level QM I. All materials are modular and can be mixed and matched with any other teaching strategy or materials.



**Type of Method**

Full curriculum, Curriculum supplement, Tutorials 




**Level**

**Designed for:** Upper-level Undergraduate 

**Can be adapted for:** Intermediate, Graduate School



**Setting**

**Designed for:** Lecture - Large (30+ students)  , Lecture - Small (<30 students)

 , Recitation/Discussion Session, Homework

**Can be adapted for:** Out-of-class tutorials



**Coverage**

Many topics with less depth, Traditional upper-division Quantum I coverage (e.g. first half of Griffiths text)



**Topics**

Modern / Quantum



**Instructor Effort**

Medium




**Resource Needs**

TAs / LAs, Clickers / polling method, Projector



**Skills**

**Designed for:** Conceptual understanding  , Problem-solving skills, Using multiple representations

**Can be adapted for:** Making real-world connections, Metacognition



**Research Validation**

**Based on research into:** theories of how students learn 

**Studied using:** student interviews  , classroom observations 



**Compatible Methods**

[Peer Instruction](#), [PhET](#), [JiTT](#), [CGPS](#), [Physlets](#), [SCALE-UP](#), [OSP](#), [LA Program](#), [CAE](#), [TPS](#), [TEFA](#), [CU Modern](#), [QuILTs](#), [Paradigms](#), [PI QM](#), [Tutorials](#), [Clickers](#)



**Similar Methods**

[CU Modern](#), [CU E&M](#), [QuILTs](#), [Paradigms](#), [PI QM](#)

 **Developer(s)**

Steven Pollock, Stephen Goldhaber, and many others in the CU PER group and the CU Physics department

 **Website**

[http://www.colorado.edu/sei/departments/physics\\_3220.htm](http://www.colorado.edu/sei/departments/physics_3220.htm)

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## **Teaching materials**

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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://www.colorado.edu/sei/departments/physics\\_3220.htm](http://www.colorado.edu/sei/departments/physics_3220.htm)