

# We use computation to teach physics

## Development and Design of a Computational Physics Lab Course

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### We designed the course to be...

- physics oriented (not computational method oriented)
- taught by a physicist
- coordinated with the *Paradigms in Physics* course sequence
- accessible to students with no computational experience
- supported by a team of LAs

### Benefits of this design are...

- students approach problems as a physicist
- Students can work with non-analytic physics problems
- content learned in the lecture course is reinforced in the computational lab course
- computational analogies can be used in the Paradigms course
- students are supported by peers who have taken the course

### In class, students...

- use Python to solve physics problems
- practice pair programming
- work with different partners each day
- are supported by the teaching team with check-ins and guided questions
- use the internet to find ways to accomplish goals and debug
- present their code to the class and explain how it works



### Ask me about...

How the course is taught remotely

The research being done on the course

The projects students do

How the computational course and lecture course fit together

### Winter 2021 Computational Physics Lab Course Webpage

Day	Topic	In class today
Introduction	Introduction	<a href="#">Computational lab introduction (PDF)</a>
Electrostatic potential	Computing and visualizing the electrostatic potential for charge distributions.	<a href="#">Electrostatic potential of four point charges (PDF)</a> <a href="#">Electrostatic potential of a square of charge</a> <a href="#">Electrostatic potential of spherical shell</a>
Electric field	Computing and visualizing the electric field for charge distributions.	<a href="#">Electric field for a waffle cone of charge</a>
Quantum wavefunctions		<a href="#">Mean position</a> <a href="#">Sinusoidal basis set</a> <a href="#">Position operator</a> <a href="#">Kinetic energy</a>

### Find out more:

Course Website: <https://beav.es/JJb>

Pedagogy: <https://paradigms.oregonstate.edu/>

Research: <https://osuper.science.oregonstate.edu/>



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