

APPLIED PHYSICS LIST OF CLASSES OPTIONS for

Computational Methods of AP and Experimental Methods of AP

Note:

The following list is not comprehensive. It is continually being updated with the help of Applied Physics students.

Since syllabi of classes can change, it is **the student's responsibility to confirm** with the respective instructor that an

- **The Computational method of AP class option has a significant, hands-on computational component,**
- **The Experimental Method of AP class option has a significant, hands-on laboratory component.**

Classes not yet listed require approval from the Director of Graduate Studies.

Computational Methods of Applied Physics approved course options

- **Applied Math**
 - [ES APPM 446](#) - 2: Numerical Solution of Partial Differential Equations
- **Chemistry**
 - [CHEM 448](#): Computational Chemistry
- **Chemical Engineering**
 - [CHEM ENG 451](#): Applied Molecular Modeling
- **Civil and Environmental Engineering**
 - [CIV ENG 495-1](#): Granular Materials for Geosystem Engineering
- **Computer Science**
 - [COMP SCI 449: Deep Learning](#)
- **Electrical Engineering**
 - [ELEC ENG 435](#): Deep Learning Foundations from Scratch
 - [ELEC-ENG 463](#): Adaptive Filtering and Estimation
(Must complete computational project for approval.)
 - [ELEC ENG 475-0 Machine Learning: Foundations, Applications, and Algorithms](#)
Course cross-listed with DATA-SCI 423
 - [ELEC ENG 495-0-77](#) Optimization techniques for machine learning and deep learning (Note: there are different classes listed under EECS 495; approval is for this specific one.)
 - [ELEC ENG 495-0-78](#) Deep learning from scratch
(Note: there are different classes listed under EECS 495; approval is for this specific one.)
- **Materials Science**
 - [MAT SCI 458](#): Atomic Scale Computational Materials Science
- **Mechanical Engineering**
 - [MECH ENG 417](#): Multiscale Modeling and Simulation in Mechanics I
 - MECH_ENG 418: Multiscale Modeling and Simulation in Mechanics II
(not offered in FY19-20)
 - MECH_ENG 423: Introduction to Computational Fluid Dynamics
(offered in alternating years, will be offered again in Fall 2020)
 - [MECH ENG 426-1](#) or [2](#): Advanced Finite Element Methods
- **Physics**
 - [PHYS 430](#): Nonlinear Dynamics And Chaos
 - [PHYS 441-0](#): Statistical Methods for Physicists and Astronomers
 - [PHYS 465](#): Advanced Topics in Nonlinear Dynamics
(not offered in FY19-20)

Experimental Methods of Applied Physics approved course options

- [MECH ENG 433](#): Advanced Mechatronics
- [MAT SCI 460](#): Electron Microscopy
- [MAT SCI 461](#): Diffraction Methods in Material Science
- [MAT SCI 465](#): Advanced Electron Microscopy & Diffraction
- [MAT SCI 466](#): Analytical Electron Microscopy
- [ELEC ENG 495](#): Cardiovascular Instrumentation