

APPLIED PHYSICS (PLEASE SEE NOTE BELOW)

Please Note: Admission to this program was discontinued effective October 5, 2021 and a teach-out plan is in place for current students.

Home Department: Natural Sciences

Daniel O. Ludwigsen, Ph.D.
Room 2-323A, 810-762-7488
naturalsciences@kettering.edu

Applied Physics Program Curriculum Requirements

Code	Title	Credit Hours
First Year Experience		
CILE-101	First Year Foundations	1
General Education		
COMM-101	Rhetoric & Writing	4
ECON-201	Economic Principles	4
LA-201	Sophomore Seminar: Exploring the Human Condition	4
LA-489	Sr. Seminar: Leadership, Ethics	4
Advanced Humanities Electives ¹		8
Advanced Social Science Electives ¹		8
Total Credit Hours		33

¹ Humanities and Social Science advanced electives must be selected from approved 300 and 400 level courses.

Code	Title	Credit Hours
Chemistry		
Select one of the following:		4
CHEM-137 & CHEM-136	General Chemistry I and Principles of Chemistry Lab	
CHEM-135 & CHEM-136	Principles of Chemistry and Principles of Chemistry Lab	
CHEM-237 & CHEM-238	General Chemistry II and General Chemistry II Lab	4
<i>Credit Hours Subtotal:</i>		<i>8</i>
Computer Science		
CS-101	Computing & Algorithms I	4
<i>Credit Hours Subtotal:</i>		<i>4</i>
Engineering		
Select one of the following:		4
EE-210 & EE-211	Circuits I and Circuits I Lab	

EE-212 & MECH-231L	Applied Electrical Circuits and Signals for Mechanical Systems Lab	
EE-240	Electromagnetic Fields and Applications	4
EP-235	Computers in Physics	4
EP-342	Introduction to Materials Science and Engineering	4
EP-485	Acoustic Testing and Modeling	4
<i>Credit Hours Subtotal:</i>		<i>20</i>

Mathematics		
MATH-101 or MATH-101X	Calculus I	4
Select one of the following:		4
MATH-102	Calculus II	
MATH-102X	Calculus II	
MATH-102H	Calculus II - Honors	
MATH-203 or MATH-203H	Multivariate Calculus	4
MATH-203H	Multivariate Calculus - Honors	
MATH-204 or MATH-204H	Differential Equations & Laplace Transforms	4
MATH-204H	Differential Equations and Laplace Transforms - Honors	
MATH-258 or MATH-327	Probability and Statistics	4
MATH-327	Probability & Stochastic Modeling	
MATH-307	Matrix Algebra	4
MATH-313	Boundary Value Problems	4
<i>Credit Hours Subtotal:</i>		<i>28</i>

Physics		
PHYS-114 & PHYS-115	Newtonian Mechanics and Newtonian Mechanics Laboratory	4
PHYS-224 & PHYS-225	Electricity and Magnetism and Electricity and Magnetism Laboratory	4
PHYS-302	Vibration, Sound and Light	4
PHYS-362	Modern Physics and Lab	4
PHYS-412	Theoretical Mechanics	4
PHYS-452	Thermodynamics and Statistical Physics	4
PHYS-462	Quantum Mechanics	4
PHYS-477	Optics and Lab	4
Advanced Physics Elective (Choose Two) ²		8
<i>Credit Hours Subtotal:</i>		<i>40</i>

Electives		
Free electives		8
Technical Electives ³		16
<i>Credit Hours Subtotal:</i>		<i>24</i>

Culminating Undergraduate Experience		
CILE-400	Culminating Undergraduate Experience: Thesis ⁴	4

Total Credit Hours 128

(Minimum) Total Credits Required for Program: 161

- ² Any PHYS or EP course that is not a core physics requirement listed above
- ³ Any 300 or 400 level Science, Math, Engineering, or Business courses approved by the academic advisor to form a sequence of courses in a specific technical field of study. Some Computer Science courses that are 100 or 200 level could be approved as a technical elective by the Physics Department Head.
- ⁴ Students are automatically registered for CILE-400 in a co-op term when they reach Junior II status.

Representative Program

Course	Title	Credit Hours
Freshman I		
CILE-101	First Year Foundations	1
CHEM-137 or CHEM-135	General Chemistry I or Principles of Chemistry	3
CHEM-136	Principles of Chemistry Lab	1
COMM-101	Rhetoric & Writing	4
CS-101	Computing & Algorithms I	4
MATH-101	Calculus I	4
Credit Hours		17
Freshman II		
CHEM-237	General Chemistry II	3
CHEM-238	General Chemistry II Lab	1
ECON-201	Economic Principles	4
MATH-102	Calculus II	4
PHYS-114	Newtonian Mechanics	3
PHYS-115	Newtonian Mechanics Laboratory	1
Credit Hours		16
Sophomore I		
MATH-203	Multivariate Calculus	4
MATH-307	Matrix Algebra	4
PHYS-224	Electricity and Magnetism	3
PHYS-225	Electricity and Magnetism Laboratory	1
LS-201	Sophomore Seminar: Exploring the Human Condition	4
Credit Hours		16
Sophomore II		
EP-235	Computers in Physics	4
MATH-204	Differential Equations & Laplace Transforms	4
PHYS-362	Modern Physics and Lab	4
Select one of the following:		4
EE-210 & EE-211	Circuits I and Circuits I Lab	
EE-212 & MECH-231L	Applied Electrical Circuits and Signals for Mechanical Systems Lab	
Credit Hours		16
Junior I		
MATH-313	Boundary Value Problems	4
PHYS-302	Vibration, Sound and Light	4

Advanced Physics Elective ²		4
Advanced Communications Elective		4
Credit Hours		16
Junior II		
EP-342	Introduction to Materials Science and Engineering	4
MATH-258 or MATH-327	Probability and Statistics or Probability & Stochastic Modeling	4
Technical Elective ¹		4
Advanced Physics Elective ²		4
Advanced Humanities Elective		4
Credit Hours		20
Senior I		
EE-240	Electromagnetic Fields and Applications	4
PHYS-412	Theoretical Mechanics	4
PHYS-477	Optics and Lab	4
Technical Elective ¹		4
Advanced Social Science Elective		4
Credit Hours		20
Senior II		
EP-485	Acoustic Testing and Modeling	4
PHYS-452	Thermodynamics and Statistical Physics	4
LS-489	Senior Seminar: Leadership, Ethics, and Contemporary Issues	4
Technical Elective ¹		4
Free Elective		4
Credit Hours		20
Senior III		
PHYS-462	Quantum Mechanics	4
Free Elective		4
Technical Elective ¹		4
Advanced Humanities, Social Science, or Communications Elective		4
Credit Hours		16
Any Term		
CILE-400	Culminating Undergraduate Experience: Thesis	4
Credit Hours		4
Total Credit Hours		161

(Minimum) Total Credits Required for Program: 161

¹ Technical Electives are any 300 or 400 level Science, Math, Engineering, or Business courses approved by the academic advisor to form a sequence of courses in a specific technical field of study. Some Computer Science courses that are 100 or 200 level could be approved as a technical elective by the Physics Department Head.

² Advanced Physics Electives includes any PHYS or EP course, which is not a core physics requirement as listed above.