

Physics BS Engineering Concentration

The program is designed for motivated students who have dual interests in physics and engineering. This program prepares undergraduate students for careers as professional physicists in industrial, university, and government laboratory settings. Students successfully completing this degree program will have satisfied the standard undergraduate requirements for admission to graduate programs in physics and engineering.

Course Availability: This is when courses are typically offered and is subject to change:

F (Fall), S (Spring), SS (Summer) F = Fall, S = Spring, SS = Summer

Common Prerequisites (34 credits)

Complete all of the following with a grade of “C” or better (16 credits)

Course	Description	Pre-requisites	Term offered	Units
MAC 2311	Calculus I	Grade of “C” or higher in MAC 1147 or MAC 1140 + MAC 1114 (or placement score without prior coursework)	F, S, SS	4
MAC 2312	Calculus II	MAC 2311	F, S, SS	4
MAC 2313	Multivariable Calculus	MAC 2312	F, S, SS	4
MAP 2302	Differential Equations	MAC 2312	F, S, SS	3
PHY 1033	Physics Pathways	N/A	F,S	1

Complete all of the following with a grade of “C” or better (18 credits)

CHM 1045	General Chemistry I	“C” grade or higher in MAC 1105 or appropriate placement score (if no prior coursework in Math/Chem) Co-requisite: CHM 1045L	F, S, SS	3
CHM 1045L	General Chemistry I Lab	Co-requisite: CHM 1045	F, S, SS	1
CHM 1046	General Chemistry II	Pre-requisite: CHM 1045 Co-requisite: CHM 1046L	F, S, SS	3
CHM 1046L	General Chemistry II Lab	Co-requisite: CHM 1046	F, S, SS	1
PHY2048	Physics W/Calculus I	Pre- or Co-requisite: MAC2311 Co-requisite: PHY 2048L	F, S, SS	4
PHY2048L	General Physics Lab I	Co-requisite: PHY 2048	F, S, SS	1
PHY2049	Physics W/Calculus II	Pre- or Co-requisite: MAC2312 Pre-requisite: PHY 2048 Co-requisite: PHY 2049L	F, S, SS	4
PHY2049L	General Physics Lab II	Co-requisite: PHY 2049	F, S, SS	1

Required Courses (52 credits)

Complete all of the following with a grade of “C” or better (22 credits)

Course	Description	Pre-requisites	Term offered	Units
PHY 3106	Modern Physics I	PHY 2049	F, S	3
PHY 3802L	Intermediate lab	Co-requisite PHY 3106	F, S	3
PHY 3513	Thermodynamics	PHY 2049, Pre or Co-requisite MAC 2313	F, S	3
PHY 4604	Quantum Mechanics I	PHY 3106, MAC 2313, MAP 2302	F	3
PHY 4323	Intermediate Electromagnetism I	PHY 2049, MAC 2313, pre or co-requisite MAP 2302	F	3
PHY 4221	Classical Mechanics I	PHY 2049 , MAC 2313	F	4
PHY 4821L	Advanced Physics Lab	MAC 2313, PHY 3802L	F, S	3

Electives must be chosen in consultation with assigned Academic Advisor

Complete 18 credits of upper division Engineering courses with a grade of “C” or better.

May include but not limited to courses below. See Panther Degree Audit for a list of course options.

Course	Description	Pre-requisites	Term offered	Units
EGN 3311	Statics	MAC 2312, PHY 2048.	F, S, SS	3
EGN 3321	Dynamics	EGN 3311, MAC 2313	F, S, SS	3
EGN 3365	Materials in Engineering	CHM 1045, MAC 2311, PHY 2048	F, S	3

Complete 12 credits of upper division Physics, Math or Engineering courses with a grade of “C” or better

May include but not limited to courses below. See Panther Degree Audit for a list of course options.

Course	Description	Pre-requisites	Term offered	Units
PHY 3107	Modern Physics II	PHY 3106	S	3
MAS 3105	Linear Algebra	MAC 2312	F, S, SS	3
MAP 4401	Advanced Differential Equations	MAP 2302, MAC 2313	S	3

Graduation Requirements:

- University Core Curriculum (UCC)
- Minimum of a 2.0 GPA
- 45 credits of Upper Division hours (3000-4000 level)
- 120 credit hours required for graduation
- Foreign Language requirement (FLENT/FLEX)
- Global Learning (GL) requirement
- Civic Literacy requirement

Students interested in Secondary Teacher Certification should contact the College of Arts, Sciences & Education Center for Advising & Student Success at (305) 348-2978.

Success Markers are guideposts that help students remain on track for graduation. The Physics Department has identified important courses in the major that indicate you are on track for successful degree completion.

- 15 credits - PHY 1033 (1), PHY 2048 (4), PHY 2048L (1), MAC 2311 (3)
- 30 credits - PHY 2049 (4), PHY 2049L (1), MAC 2312 (4),
- 45 credits - PHY 3106 (3), PHY 3802L (3), PHY 3513 (3), MAP 2302 (3), MAC 2313 (4)
- 60 credits - CHM 1045 (3), CHM 1045L (1), PHZ 3113 (3)
- 75 credits - CHM 1046 (3), CHM 1046L (1), PHY 4323 (3), PHY 4604 (3), PHY 4221 (3)
- 90 credits - PHY 4324 (3), PHY 4605 (3)
- 105 credits - PHY 4821L (3)

In cases where students are not making good progress, a change of major may be required.