BS Mathematical Sciences
Physics track- Fall 2022

The major in Mathematics – Physics Track gives an opportunity for undergraduate mathematics students interested in physics to be exposed to the interplay between the two disciplines. It also provides a firm mathematical foundation needed for graduate studies in the physical sciences.

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 (28-29 credits)
Complete all of the following with a grade of "C" or better (15 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

Complete one of the following with a grade of "C" or better (3-4 credits):

Course	Description	Pre-requisites	Term offered	Units
COP 2210	Intro to Programming	MAC 1140 or MAC 1147 or MAC 2233 or MAC 2311	F, S, SS	4
COP 2250	Java Programming		F, S, SS	3

Complete both lectures with corresponding labs with a grade of "C" or better (10 credits):

Course	Description	Pre-requisites	Term offered	Units
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 Co-requisite: PHY 2049L	F, S, SS	4
PHY2049L	General Physics Lab II	Co-requisite: PHY 2049	F, S, SS	1

* PHY 2048 and PHY 2049 (with labs) are required for upper division Physics courses

Required Courses (40-41 credits)
Complete all of the following with a grade of "C" or better (28 credits)

Course	Description	Pre-requisites	Term offered	Units
MAD 2104	Discrete Mathematics	MAC 1105 or appropriate placement score	F, S, SS	3
MAS 3105	Linear Algebra	MAC 2312	F, S, SS	3
MAA 3200	Intro to Advanced Math	MAC 2312 and MAD 2104	F, S, SS	3
MAD 3401	Numerical Analysis	COP 2210 or COP 2250 or COP 2270 or CGS 2420 and MAC 2312	F, S, SS	3
MAP 4104C	Topics in Math Modeling	MAP 2302, MAC 2313, MAS 3105	F	4
MAP 4401	Advanced Differential Eqs	MAP 2302 and MAC 2313	S	3
STA 4321	Mathematical Statistics I	MAC 2313	F	3
PHY 3106	Modern Physics	PHY 2049	F, S	3
PHY 3802L	Intermediate Physics Lab	Co-requisite: PHY 3106	F, S	3

Complete one of the following with a grade of "C" or better (3 credits, Global Learning Discipline Specific):

Course	Description	Pre-requisites	Term offered	Units
IDS 4174	Mathematics and Philosophy in Arts- GL	N/A	F	3

| MHF 3404 | History of Mathematics- GL | MAC 2312 "C" or MAC 2311 and permission of the instructor. | F | 3 |
| MHF 4401 | Methods in the History of Modern Mathematics- GL | MAC 2313 and MAS 3105 | S | 3 |

Complete Option 1, 2, or 3 with a grade of "C" or better (6-7 credits)
OPTION 1 (7 credits)

Course	Description	Pre-requisites	Term offered	Units
PHY 4221	Intro to Classical Mechanics	PHY 2049, MAC 2313	F	4
PHY 4222	Adv Classical Mechanics	PHY 4221	S	3

OPTION 2 (6 credits)

Course	Description	Pre-requisites	Term offered	Units
PHY 4323	Interm Electromag I	MAC 2313, PHY 2049 and pre- or co-requisite MAP 2302	F	3
PHY 4324	Interm Electromag II	PHY 4323	S	3

OPTION 3 (6 credits)

Course	Description	Pre-requisites	Term offered	Units
PHY 4604	Quantum Mechanics I	PHY 3106, MAP 2302, MAC 2313	F	3
PHY 4605	Quantum Mechanics II	PHY 4604	S	3

Mathematics Electives (3 credits)

Pick 1 from the following list of electives with a grade of "C" or better (3 credits)

Course	Description	Pre-requisites	Term offered	Units
MAA 4211	Advanced Calculus I	MAC 2313, MAS 3105, and MAA 3200	S	3
MAA 4402	Complex Variables	MAC 2313, and MAP 2302 or MAA 4211	F	3
MAA 4504	Functional Analysis	MAC 2313, MAC 3105	Consult Advisor	3
MAP 4215	Stochastic Diff Equations	MAP 2302, MAC 2313, MAS 3105, STA 4321	F	3
MAP 4315	Nonlinear Dynamics w Applications to Sciences	MAC 2313 or MAP 2302 or MAS 3105, or permission of the instructor	Consult Advisor	3
MAP 4412	Intro to Fourier Analysis	MAC 2313, MAS 3105		3
MAS 4301	Algebraic Structures	MAS 3105 and MAA 3200	S	3
MTG 4254	Differential Geometry	MAC 2311, MAS 3105, MAP 2302 or permission from the instructor	S, alt yrs	3
STA 4322	Mathematical Statistics II	STA 4321	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