

## BS Mathematical Sciences Comprehensive Track- Fall 2022

The major in Mathematics – Comprehensive Track is the traditional bachelor's degree in mathematics offering students the possibility of learning rigorously and deeply the fundamental ideas and concepts of modern mathematics. This track is mainly designed for students intending to pursue graduate studies in Mathematics or Graduate schools leading to careers in academia or 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 (26-29 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):

|          |                      |                                              |          |   |
|----------|----------------------|----------------------------------------------|----------|---|
| 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 |
| COP 2047 | Python Programming I |                                              | F, S, SS | 3 |

Complete two lectures with corresponding labs with a grade of "C" or better (8-10 credits):

|           |                          |                                                                                                                                 |          |   |
|-----------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------|---|
| BSC 2010  | General Biology I        | Co-requisite: BSC 2010L                                                                                                         | F, S, SS | 3 |
| BSC 2010L | General Biology I Lab    | Co-requisite: BSC 2010                                                                                                          | F, S, SS | 1 |
| BSC 2011  | General Biology II       | Co-requisite: BSC 2011L                                                                                                         | F, S, SS | 3 |
| BSC 2011L | General Biology II Lab   | Co-requisite: BSC 2011                                                                                                          | F, S, SS | 1 |
| CHM 1045  | General Chemistry I      | "C" grade or higher in MAC 1105 or appropriate placement score (if no prior coursework in Math/Chem)<br>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     | Prerequisite: CHM 1045<br>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                                                                                                   | F, S, SS | 4 |
| PHY2048L  | General Physics Lab I    | N/A                                                                                                                             | F, S, SS | 1 |
| PHY2049   | Physics W/Calculus II    | Pre- or Co-requisite: MAC2312<br>Prerequisite: PHY 2048                                                                         | F, S, SS | 4 |
| PHY2049L  | General Physics Lab II   | Co-requisite: PHY 2048L                                                                                                         | F, S, SS | 1 |
| GLY 1010  | Physical Geology         | N/A                                                                                                                             | F, S, SS | 3 |
| GLY 1010L | Physical Geology Lab     | N/A                                                                                                                             | F, S, SS | 1 |

### Required Courses (40-41 credits)

Complete all of the following with a grade of "C" or better (19 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     | MAD 2104 and MAC 2312            | F, S     | 3 |
| MAA 4211 | Advanced Calculus I        | MAC 2313, MAS 3105, and MAA 3200 | S        | 3 |
| MAS 4301 | Algebraic Structures       | MAS 3105 and MAA 3200            | S        | 3 |
| STA 4321 | Mathematical Statistics I  | MAC 2313                         | F        | 3 |
| MAT 4934 | Senior Mathematics Seminar | Sr. Standing                     | F, S     | 1 |

Complete one course from the following list with a grade of “C” or better (3 credits):

| 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              | Consult advisor | 3     |
| MHF 4401 | Methods in the History of Modern Mathematics- GL | MAC 2313 and MAS 3105 | Consult advisor | 3     |

Complete three courses for each of the following lists with a grade of “C” or better (18-19 credits)

Pick 3 from List 1 (9 credits)

| Course   | Description                    | Pre-requisites                     | Term offered    | Units |
|----------|--------------------------------|------------------------------------|-----------------|-------|
| MAD 4203 | Intro to Combinatorics         | MAC 2312 and MAD 2104              | F               | 3     |
| MAA 4402 | Complex Variables              | MAC 2313, and MAP 2302 or MAA 4211 | F               | 3     |
| MTG 3212 | College Geometry               | MAC 2312 or instructor permission  | F               | 3     |
| MAS 4203 | Number Theory                  | MAA 3200 or MAS 3105 or MTG 2312   | F               | 3     |
| MAA 4212 | Advanced Calculus II           | MAA 4211                           | F               | 3     |
| MAS 4302 | Topics in Algebraic Structures | MAS 4301                           | F               |       |
| MTG 4302 | Topology                       | MAC 2313, MAS 3105 and MAA 3200    | Consult advisor | 3     |

Pick 3 from List 2 (9-10 credits)

| Course    | Description                | Pre-requisites                                                               | Term offered    | Units |
|-----------|----------------------------|------------------------------------------------------------------------------|-----------------|-------|
| MAP 4401  | Advanced Differential Eqs  | MAP 2302 and MAC 2313                                                        | S               | 3     |
| MAD 3301  | Graph Theory               | COP 2210 or COP 2250 or COP 2270 or CGS 2420 and either MAS 3105 or MAD 2104 | F, S            | 3     |
| MAP 4104C | Topics in Math Modeling    | MAP 2302, MAC 2313, MAS 3105                                                 | F               | 4     |
| STA 4322  | Mathematical Statistics II | STA 4321                                                                     | S               | 3     |
| MAD 3401  | Numerical Analysis         | COP 2210 or COP 2250 or COP 2270 or CGS 2420 and MAC 2312                    | F, S            | 3     |
| MHF 4302  | Mathematical Logic         | MAA 3200 or MAD 3512                                                         | Consult advisor | 3     |
| MHF 4102  | Axiomatic Set Theory       | MAA 3200 or instructor permission                                            | Consult advisor | 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)
- 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