

B.S. in Computational Mathematics

The Computational Mathematics program hosted within the College of Arts & Sciences, prepares students to operate at the intersection of applied mathematics, computer science, and scientific application areas. Designed with a strong emphasis on real-world applications, and hands-on experience, the program equips students to implement computational methods and develop models to analyze and solve complex problems arising from wide range of fields.

All students in the Computational Mathematics program are encouraged to participate in industrial or faculty-mentored research opportunities, gaining valuable experience in applying mathematical and computational tools in professional settings. These opportunities foster collaboration, innovation, and career readiness.

By the end of their second year, students select one of two specialized tracks: the Data Science Track or the Engineering Application Track, allowing them to tailor their studies to their interests and career goals. In addition, students complete a minor or second major that complements the program core and strengthens their expertise in a related discipline.

With its strong emphasis on applied mathematics, computing, and interdisciplinary applications, the program prepares graduates for entry-level positions in industry and provides a solid foundation for graduate study, including pathways such as the Master's in Data Science.

Data Science Track

- Designed for students interested in developing expertise in this high-growth field
- Uses interdisciplinary methods to extract knowledge from large datasets
- Builds a strong foundation in creating data-driven insights to solve real-world problems

Engineering Application Track

- Designed for students interested in computationally intensive, project-based coursework
- Provides interdisciplinary knowledge in fundamental mathematical sciences
- Introduces concepts in computation, optimal decision-making, high-performance computing, and statistical inference

Program-Level Student Learning Outcomes

Students will:

- Work effectively in teams to solve scientific problems with significant mathematical content.
- Use mathematical libraries, packages, or software to solve scientific problems.
- Use numerical techniques to solve applied problems.
- Orally communicate mathematical ideas effectively.
- Use theoretical foundations of statistics to analyze data sets.
- Prepare written scientific project reports to communicate mathematical ideas effectively.

Daytona Beach Program Requirements

General Education Requirements	39
Core Requirements	17
Track	19
Electives	45
Total Credits	120

General Education Requirements

Communication	9
COMM 122	English Composition
COMM 219	Speech
COMM 221	Technical Communication
Humanities - Lower Level	3
Social Sciences - Lower Level	3
Humanities/Social Sciences - Lower or Upper Level	3
Humanities/Social Sciences - Upper Level	3
Computer Science/Information Technology	3
CPSC 223	Scientific Programming in C
or CPSC 225	Computer Science II
or ENGR 115	Introduction to Computing for Engineers
Mathematics	8
MATH 241	Calculus and Analytical Geometry I
MATH 242	Calculus and Analytical Geometry II
Physical/Life Sciences	7
Total Credits	39

Core Requirements

MATH 243	Calculus and Analytical Geometry III	4
MATH 305	Introduction to Scientific Computing	3
MATH 392	Applied Linear Algebra	3
MATH 412	Probability and Statistics	3
MATH 490	Capstone Project	3
or DSCI 490	Data Science Capstone	
UNIV 101	College Success	1
Total Credits		17

Tracks

Data Science

MATH 345	Differential Equations and Matrix Methods	4
or CPSC 317	Files and Database Systems	
& MATH 325	and Matrix Methods	
MATH 348	Numerical Methods	3
or MATH 360	Mathematical Modeling and Simulation I	
or DSCI 390	Research Project in Industrial Mathematics	
DSCI 412	Data Visualization	3
DSCI 413	Statistics for Data Science	3
or MATH 404	Statistics and Research Methods	
MATH 410	Linear Optimization	3
DSCI 440	Data Mining	3
Total Credits		19

Engineering Application

MATH 345	Differential Equations and Matrix Methods	4
MATH 348	Numerical Methods	3
MATH 441	Mathematical Methods for Engineering and Physics I	3
MATH 442	Mathematical Methods for Engineering and Physics II	3
MATH 410	Linear Optimization	3
or MATH 453	High Performance Scientific Computing	
MATH 448	Numerical Methods for Differential Equations	3
or MATH 488	Data-driven Numerical Methods for Differential Equations	
Total Credits		19

Electives

All Students Must Declare and Complete Any Minor/Two Degrees of Same Rank/Double Major (ROTC Courses Also Acceptable)	15
Open Electives	30
Total Credits	45

Suggested Plan of Study

Track: Engineering Application

Year One

Requirements	Credits
COMM 122 - English Composition	3
MATH 241 - Calculus and Analytical Geometry I	4
ENGR 115 - Introduction to Computing for Engineers	3
UNIV 101 - College Success	1
Social Sciences - Lower Level	3
Semester Hours	14

Requirements	Credits
COMM 219 - Speech	3
MATH 242 - Calculus and Analytical Geometry II	4
Humanities - Lower Level (Series 140)	3
Physical Science	3
Open Elective	3
Semester Hours	16

Total Credits

Total Hours for All Requirements: 30

Year Two

Requirements	Credits
COMM 221 - Technical Communication	3
MATH 243 - Calculus and Analytical Geometry III	4
MATH 305 - Introduction to Scientific Computing	3
Physical/Life Sciences	3
Phsical Life Sciences Lab	1
Semester Hours	14

Requirements	Credits
MATH 345 - Differential Equations and Matrix Methods	4
MATH 412 - Probability and Statistics	3
Humanities/Social Sciences - Lower or Upper Level	3
Minor Course	3
Open Elective	3
Semester Hours	16

Total Credits

Total Hours for All Requirements: 30

Year Three

Requirements	Credits
MATH 441 - Mathematical Methods for Engineering and Physics I	3
MATH 392 - Applied Linear Algebra	3
Humanities/Social Sciences - Upper Level	3
Minor Course	3
Open Elective	3
Semester Hours	15

Requirements	Credits
MATH 442 - Mathematical Methods for Engineering and Physics II	3
MATH 348 - Numerical Methods	3
Minor Course	3
Open Elective	3
Open Elective	3
Semester Hours	15

Total Credits

Total Hours for All Requirements: 30

Year Four

Requirements	Credits
MATH 453 - High Performance Scientific Computing	3
Minor Elective	3
Open Elective	3
Open Elective	3
Open Elective	3
Semester Hours	15

Requirements	Credits
MATH 448 - Numerical Methods for Differential Equations	3
MATH 490 - Capstone Project	3
Minor Course	3
Open Elective	3
Open Elective	3
Semester Hours	15

Total Credits

Total Hours for All Requirements: 30

Track: Data Science

Year One

Requirements	Credits
COMM 122 - English Composition	3
MATH 241 - Calculus and Analytical Geometry I	4
ENGR 115 - Introduction to Computing for Engineers	3
UNIV 101 - College Success	1
Social Sciences - Lower Level	3
Semester Hours	14

Requirements	Credits
COMM 219 - Speech	3
MATH 242 - Calculus and Analytical Geometry II	4

Humanities - Lower Level (Series 140)	3
Physical/Life Sciences Elective	3
Open Elective	3
Semester Hours	16

Total Credits

Total Hours for All Requirements: 30

Year Two

Requirements	Credits
COMM 221 - Technical Communication	3
MATH 243 - Calculus and Analytical Geometry III	4
MATH 305 - Introduction to Scientific Computing	3
Physical/Life Sciences	3
Physical/Life Sciences Lab	1
Semester Hours	14

Requirements	Credits
MATH 345 - Differential Equations and Matrix Methods	4
MATH 412 - Probability and Statistics	3
Humanities/Social Sciences - Lower or Upper Level	3
Minor Course	3
Open Elective	3
Semester Hours	16

Total Credits

Total Hours for All Requirements: 30

Year Three

Requirements	Credits
DSCI 390 - Research Project in Industrial Mathematics	3
Humanities/Social Sciences - Upper Level	3
Minor Course	3
Open Elective	3
Open Elective	3
Semester Hours	15

Requirements	Credits
DSCI 413 - Statistics for Data Science	3
MATH 392 - Applied Linear Algebra	3
Minor Course	3
Open Elective	3
Open Elective	3
Semester Hours	15

Total Credits

Total Hours for All Requirements: 30

Year Four

Requirements	Credits
DSCI 440 - Data Mining	3
MATH 410 - Linear Optimization	3

DSCI 490 - Data Science Capstone	3
Minor Course	3
Open Elective	3
Semester Hours	15

Requirements	Credits
DSCI 412 - Data Visualization	3
Minor Elective	3
Open Elective	3
Open Elective	3
Open Elective	3
Semester Hours	15

Total Credits

Total Hours for All Requirements: 30