Admission Requirements
- None

Degree Requirements
- Students who change degree programs and select this major must adopt the most current catalog.
- Departmental Residency Requirement: at least 24 semester hours of regularly scheduled 3000-4000 level courses must be taken from the UCF Mathematics Department.
- Students must earn at least a C (2.0) in each course used to satisfy a requirement.
- Students must achieve a minimum cumulative GPA of 2.0 in all courses satisfying major requirements.
- Co-op or internship credit cannot be used in this major.
- Students should consult with a departmental advisor.
- All prerequisites of courses taught within the College of Sciences will be enforced.
- Courses designated in 1 (General Ed Program) and 2 (Common Program Prerequisites) are usually completed in the first 60 hours.
- All mathematics courses, except the following, must be either taken from, or approved by, the Department of Mathematics at UCF:
  - MAC 2311C Calculus with Analytic Geometry I
  - MAC 2312 Calculus with Analytic Geometry II
  - MAC 2313 Calculus with Analytic Geometry III
  - MAP 2302 Ordinary Differential Equations I

Note: the following courses will not satisfy any Math degree requirements:
- MTG 4212 Modern Geometries
- MHF 4404 History of Mathematics

1. UCF General Education Program (GEP) (38 hrs)
- (Note: Certain courses must be selected for this major, bringing GEP hours above 36)
- Some concentrations require particular selections of courses in the GEP program. Please consult the desired concentration listed below.

A: Communication Foundations (9 hrs)
B: Cultural & Historical Foundations (9 hrs)

C: Mathematical Foundations (7 hrs)
  - Required COP 3502C Computer Science I
  - Required MAC 2311C Calculus with Analytic Geometry I

D: Social Foundations (6 hrs)
  - Required ECO 2023 Principles of Microeconomics

2. Select a course listed in GEP Program 3 hrs

E: Science Foundations (8 hrs)
  - Select one:
    - Suggested PHV 2048G General Physics Using Calculus I
    - Suggested CHM 2045C Chemistry Fundamentals I
  - AND
    - Suggested BSC 2010C Biology I

2. Common Program Prerequisites (CPP) (11 hrs)
- See “Common Prerequisites” in the Transfer and Transitions Services section for more information.
- See Transfer Notes for possible substitutions of certain courses.
  - COP 3502C Computer Science I
  - MAC 2311C Calculus with Analytic Geometry I
  - MAC 2312 Calculus with Analytic Geometry II
  - MAC 2313 Calculus with Analytic Geometry III
  - MAP 2302 Ordinary Differential Equations I

Select from the courses listed in the GEP Program 4 hrs
  - CHM 2045C Chemistry Fundamentals I
  - BSC 2010C Biology I
  - PHY 2048C General Physics Using Calculus I

3. Core Requirements: Basic Level (22 hrs)
- All courses specifically identified in the preceding Common Program Prerequisites section of this catalog are also required in the Basic Core, and must be taken.
- Selection of the Science sequence may need to reflect the student’s track. Consult the requirements of the track before selecting the science sequence.
- The Mathematical Biology track requires all three of the CHM 2045C/2046/2047, the BSC 2010C/2011C, and the PHY 2048C/2049C sequences.
- The Engineering/Physics track requires the PHY 2048C/2049C sequence.

Core: Basic Requirements
  - COP 3502C Computer Science I and GEP
  - MAC 2311C Calculus with Analytic Geometry I and GEP
  - MAC 2312 Calculus with Analytic Geometry II and CPP
  - MAC 2313 Calculus with Analytic Geometry III and CPP
  - MAP 2302 Ordinary Differential Equations I and CPP

Core: Science Sequence:
- Select from the following 4 hrs
  - CHM 2045C Chemistry Fundamentals I
  - BSC 2010C Biology I
  - PHY 2048C General Physics Using Calculus I
- Or -
  - CHM 2046 Chemistry Fundamentals II
  - BSC 2011C Biology II
  - PHY 2049C General Physics Using Calculus II

Core: Additional Requirements 18 hrs
- Substitution of COT 3100 for MHF 3302 is possible with approval of Department Undergraduate Coordinator.
  - MAA 4226 Advanced Calculus I
  - MAS 3105 Matrix and Linear Algebra
  - MAS 3106 Linear Algebra
  - MAS 4301 Abstract Algebra I
  - MHF 3302 Logic and Proof in Mathematics

4. Core Requirements: Advanced Level
- None

5. Restricted Electives
- Students must select one of the following tracks.
  - A. General Mathematics Track 18 hrs
    - Select 3 credit hour from 4000 or 5000 level courses
    - with an MAP or MAT prefix offered by the Department of Mathematics
    - Select 3 credit hour from 4000 or 5000 level courses
    - with an MAA, MAD, MAS or MTG prefix offered by the Department of Mathematics, except MTG 4212.
    - Select an additional 12 credits from 4000 or 5000 level courses offered by the Department of Mathematics except
      MTG 4212 or MHF 4404.
  - B. Applied Mathematics Track 18 hrs
    - Select 3 credit hour from 4000 or 5000 level courses
    - with an MAA, MAD, MAS or MTG prefix offered by the Department of Mathematics
  - C. Mathematical Biology Track 18 hrs
    - Select 3 credit hour from 4000 or 5000 level courses
### B. Mathematical Biology Track

**Track Prerequisites:**
- BSC 2010G GEP (or equivalent)
- BSC 2010CG
- CHM 2045G GEP (or equivalent)
- PHY 2048C
- PHY 2049C

**Take all of the following:**
- CHM 2211L
- PHY 2049C
- Any 4000 or 5000 level course with an MAA, MAD, MAS or MTG prefix offered by the Department of Mathematics and PHY 2049 or 5000 level course with an MAA, MAD, MAS or MTG prefix offered by the Department of Mathematics except MTG 4212
- Select 9 credit hours from lecture courses listed in the restricted electives within the Biology and/or Biomedical Sciences programs.

**And select 9 credit hours from the following:**
- ECO 3703 International Microeconomics or 3 hrs
- ECO 3101 International Macroeconomics or 3 hrs
- ECO 4412 Econometrics and 3 hrs
- MAP 4113 Probability, Random Processes and Applications and 3 hrs
- MAP 4640 Financial Mathematics and 3 hrs
- STA 3203 Statistical Methods I and 3 hrs
- STA 3212 Statistical Theory I and 3 hrs
- Select 3 credit hours from 4000 or 5000 level courses with an MAA, MAD, MAS or MTG prefix offered by the Department of Mathematics except MTG 4212

**C. Mathematical Economics Track**

**Track Prerequisites:**
- ECO 2023 Principles of Microeconomics (GEP)

**Take all of the following:**
- ECO 2013 Principles of Macroeconomics and 3 hrs
- ECO 3010 Intermediate Microeconomics and 3 hrs
- ECO 3203 Intermediate Macroeconomics and 3 hrs
- ECO 3410 Mathematical Economics and 3 hrs
- ECO 4412 Econometrics and 3 hrs
- MAP 4113 Probability, Random Processes and Applications and 3 hrs
- MAP 4640 Financial Mathematics and 3 hrs
- STA 3203 Statistical Methods I and 3 hrs
- STA 3212 Statistical Theory I and 3 hrs
- Select 3 credit hours from 4000 or 5000 level courses with an MAA, MAD, MAS or MTG prefix offered by the Department of Mathematics except MTG 4212
- And select 6 credit hours from the following:
  - ECO 3703 International Microeconomics or 3 hrs
  - ECO 4504 Public Economics or 3 hrs
  - ECO 4713 International Macroeconomics or 3 hrs
  - ECP 4303 Environmental and Natural Resources Economics or 3 hrs
  - ECP 4403 Industrial Organization or 3 hrs
  - STA 3212 Statistical Theory I and 3 hrs

**D. Computational Track**

**Track Prerequisites:**
- COP 3502C Computer Science I (GEP)

**Take all of the following:**
- COP 3503C Computer Science II and 3 hrs
- MAP 4303 Ordinary Differential Equations II and 3 hrs
- MAP 4341 Introduction to Partial Differential Equations and 3 hrs
- MAP 4371 Numerical Methods for Differential Equations and 3 hrs
- MAP 4384 Numerical Methods for Computational Sciences and 3 hrs
- STA 2023 Statistical Methods I and 3 hrs
- STA 3212 Statistical Theory I and 3 hrs
- Select 3 credit hours from courses MTG 4212 or HHF 4404

**And select 9 credit hours from the following:**
- COP 3402 Systems Software or 3 hrs
- COP 4020 Programming Languages I or 3 hrs
- COT 4210 Discrete Structures II or 3 hrs
- COP 4331C Processes for Object-Oriented Software Development or 3 hrs
- COP 4600 Operating Systems or 3 hrs
- EEL 4768 Computer Architecture or 3 hrs

### E. Engineering/Physics Track

**Track Prerequisites:**
- PHY 2048C Physics for Engineers & Scientists I (GEP/CPP) or
- PHY 2049C Physics for Engineers and Scientists II (CPP)

**Take all of the following courses:**
- EGN 3321 Engineering Analysis-Dynamics and 3 hrs
- EMA 4402 Introduction to Complex Variables and 3 hrs
- MAP 4103 Mathematical Modeling I and 3 hrs
- MAP 4303 Ordinary Differential Equations II and 3 hrs
- MAP 4341 Introduction to Partial Differential Equations and 3 hrs
- PHY 3101 General Physics Using Calculus III or 3 hrs
- Select 1:
  - EGN 3310 Numerical Calculus or 3 hrs
  - EGN 3420 Engineering Analysis or 3 hrs
  - MAP 4371 Numerical Methods for Differential Equations or 3 hrs
  - MAP 4384 Numerical Methods for Computational Sciences or 3 hrs
  - PHZ 3151 Computer Methods in Physics or 3 hrs
- Select 1:
  - EEM 3343 Thermodynamics or 3 hrs
  - EGN 3358 Thermo-Fluids-Heat Transfer or 3 hrs
  - PHY 3513 Thermal and Statistical Physics or 3 hrs

**Select at least 6 hours:**
- CES 4100C Structural Analysis I and Lab or 4 hrs
- EAS 3101 Fundamentals of Aerodynamics or 3 hrs
- EEL 3004C Electrical Networks or 3 hrs
- EGN 3601 Solid Mechanics or 3 hrs
- EGN 3331C Mechanics of Materials or 3 hrs
- ESI 4312 Operations Research or 3 hrs
- EPH 4504 Wave Mechanics I or 3 hrs
- EPH 4505 Wave Mechanics II or 3 hrs
- Select 1:
  - EAY 4200 Analysis & Design of Aerospace Structures or 3 hrs
  - EAS 4400 Spacecraft Attitude Dynamics or 3 hrs
  - EAS 4505 Orbital Mechanics or 3 hrs
  - EEE 3342C Digital Systems or 3 hrs
  - EEL 3470 Electromagnetic Fields or 3 hrs
  - EEL 3552C Analog and Digital Communication or 4 hrs
  - EEL 3657 Linear Control Systems or 3 hrs
  - EEL 3801C Computer Organization or 3 hrs
  - EEL 4742C Embedded Systems or 4 hrs
  - EEL 4750 Digital Signal Processing Fundamentals or 3 hrs
  - EEL 4832 Engineering Applications of Computer Methods or 3 hrs
- Select 1:
  - EEL 4851C Engineering Data Structures or 4 hrs
  - EGN 3365 Structure and Properties of Materials or 3 hrs
  - EGM 3310 Engineering Economic Analysis or 3 hrs
  - EIN 4333 Production and Distribution Systems or 3 hrs
  - EIN 4332 Fundamentals of Mechanical Behavior or 3 hrs
  - EML 3262 Kinematics of Mechanisms or 3 hrs
  - EML 3701 Fluid Mechanics I or 3 hrs
  - EML 4142 Heat Transfer or 3 hrs
  - EML 4225 Introduction to Vibrations and Controls or 3 hrs
  - EML 4313 Intermediate System Dynamics and Controls or 3 hrs

UNIVERSITY OF CENTRAL FLORIDA
UCF Degree Programs

- Certificates
- Related Programs
- Admissions
- Graduation
- Electives
- Departmental Exit Requirements
- University Minimum Exit Requirements
- Total Semester Hours Required
- Honors In Major
- Related Programs
- Certificates

6. Capstone Requirements
- None

7. Foreign Language Requirements

Admissions
- Two years high school or one year college language (or equivalent proficiency exam) prior to graduation.

Graduation
- None

8. Electives
- Select primarily from upper level courses, with departmental advisor’s approval. May be outside of the department.

9. Additional Requirements
- None

10. Required Minors
- None

11. Departmental Exit Requirements
- Earn a grade of "C" (2.0) or better in each course used to satisfy the degree program.
- Students must achieve a minimum cumulative GPA of 2.0 in all courses satisfying major requirements.
- Participate in an exit interview.
- Fulfill Exit Examination requirement.

12. University Minimum Exit Requirements
- A 2.0 UCF GPA
- 60 semester hours earned after CLEP awarded
- 48 semester hours of upper division credit completed
- 30 of the last 39 hours of course work must be completed in residency at UCF.
- A maximum of 45 hours of extension, correspondence, CLEP, Credit by Exam, and Armed Forces credits permitted.
- Complete the General Education Program, the Gordon Rule, and nine hours of Summer credit.

Total Semester Hours Required
- 120

Honors In Major
- Application and admission through the Department and the Burnett Honors College.
- Fulfill University requirements for Honors in the Major.

Related Programs
- Aerospace Engineering
- Biology
- Biomedical Sciences
- Chemistry
- Computer Science
- Economics
- Electrical Engineering
- Industrial Engineering
- Mathematics Education
- Mechanical Engineering
- Physics
- Statistics

Certificates
- None

Related Minors
- Actuarial Science
- Bioengineering
- Biology
- Biomedical Sciences
- Chemistry
- Computer Science
- Economics
- Education
- Environmental Studies
- Information Technology
- Mathematics
- Mathematics Education
- Physics
- Statistics
- Technological Entrepreneurship

Advising Notes
- Students with adequate preparation can consult with the department undergraduate advisor on substituting graduate classes for departmental electives.

Transfer Notes
- Lower division courses do not substitute for upper division courses.
- Courses transferred from private and out-of-state schools must be evaluated for equivalency credit. The student must provide all supporting information.

Acceptable Substitutes for Transfer Courses
- The following substitutions are acceptable for common program prerequisites if taken as part of the AA course work prior to transferring to UCF:
  - Computer Programming: may use any programming course with a COP prefix.
  - Laboratory Science: may use any GLY, PHY, CHM or BSC course with a lab designed for science majors; however, the biology, chemistry and physics classes are core requirements and still must be taken.

Plan of Study
- This is one of numerous possible plans of study. See program description for all requirements. Consult a departmental advisor for alternate, new or more appropriate selections.
- Although all classes are listed as being taken during the academic year, you may be required to complete 9 hours of them during the Summer. Consult with an advisor to determine if you are exempt.
- Prior to enrolling in Chemistry, take Chemistry Placement Test ~ http://knightsource.sdes.ucf.edu/placement
- Prior to enrolling in Math, take Math Placement Test ~ http://utc.sdes.ucf.edu
- Below Plan of Study designed to pursue graduate study.

Freshman Year - Fall
- MAC 2311C Calculus with Analytic Geometry I
- ENC 1101 Composition I
- BSC 2010C Biology I
- MAC 2312 Calculus with Analytic Geometry II
- PHI 2010 Introduction to Philosophy

Freshman Year - Spring
- MAC 2311C Calculus with Analytic Geometry I
- ENC 1102 Composition II
- ECO 2023 Principles of Microeconomics
- EOU 2000 Western Civilization I

Sophomore Year - Fall
- MAC 2311C Calculus with Analytic Geometry III
- MAS 3105 Matrix and Linear Algebra
- COP 3502C Computer Science I
- PHY 2048C General Physics Using Calculus I
- SPC 1603C Fundamentals of Technical Presentations

Sophomore Year - Spring
- MAP 2302 Ordinary Differential Equations I
- MAS 3105 Linear Algebra
- PHY 2048C General Physics Using Calculus II
- PSY 2012 General Psychology

UNIVERSITY OF CENTRAL FLORIDA

Undergraduate Catalog 2016-2017
### Junior Year - Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>MAD 4203</td>
<td>Introduction to Combinatorics</td>
<td>3 hrs</td>
</tr>
<tr>
<td>MAP 4303</td>
<td>Ordinary Differential Equations II</td>
<td>3 hrs</td>
</tr>
<tr>
<td>MAP 4384</td>
<td>Numerical Methods for Computational Sciences</td>
<td>3 hrs</td>
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<tr>
<td>Elective</td>
<td></td>
<td>3 hrs</td>
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### Junior Year - Spring

<table>
<thead>
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<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>MAD 4301</td>
<td>Introduction to Graph Theory</td>
<td>3 hrs</td>
</tr>
<tr>
<td>MAA 4402</td>
<td>Introduction to Complex Variables</td>
<td>3 hrs</td>
</tr>
<tr>
<td>MAP 4371</td>
<td>Numerical Methods for Differential Equations</td>
<td>3 hrs</td>
</tr>
<tr>
<td>Elective</td>
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### Senior Year - Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>MAA 4226</td>
<td>Advanced Calculus I</td>
<td>4 hrs</td>
</tr>
<tr>
<td>MAP 4153</td>
<td>Vector and Tensor Analysis</td>
<td>3 hrs</td>
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<tr>
<td>MAP 4341</td>
<td>Introduction to Partial Differential Equations</td>
<td>3 hrs</td>
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<tr>
<td>MAP 4903H</td>
<td>Honors Directed Reading I</td>
<td>1 hr</td>
</tr>
<tr>
<td>MAS 4301</td>
<td>Abstract Algebra I</td>
<td>3 hrs</td>
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</table>

### Senior Year - Spring

<table>
<thead>
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<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>MAA 4227</td>
<td>Advanced Calculus II</td>
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<tr>
<td>MAP 4970H</td>
<td>Undergraduate Honors Thesis</td>
<td>1 hr</td>
</tr>
<tr>
<td>MAS 4302</td>
<td>Abstract Algebra II</td>
<td>3 hrs</td>
</tr>
<tr>
<td>MTG 4254</td>
<td>Introduction to Differential Geometry</td>
<td>3 hrs</td>
</tr>
<tr>
<td>MTG 4302</td>
<td>Introduction to Topology</td>
<td>3 hrs</td>
</tr>
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</table>

### Program Academic Learning Compacts

Program Academic Learning Compacts (student learning outcomes) for undergraduate programs are located at:

[http://www.oeas.ucf.edu/alc/academic_learning_compacts.htm](http://www.oeas.ucf.edu/alc/academic_learning_compacts.htm)