

UCF Degree Programs

MATHEMATICS - ENGINEERING/PHYSICS TRACK (B.S.)

College of Sciences

Department of Mathematics, MAP 207, 407-823-6284

<http://math.ucf.edu>

E-mail: math@mail.ucf.edu

Contact: H. Martin, MAP 215A, 407-823-5700,

E-mail: martin@math.ucf.edu

The Department of Mathematics offers courses identified by a suffix of H for students in the Honors Program; e.g., MAC 2311H, MAC 2312H, MAC 2313H, and MAP 2302H.

Admission Requirements

none

Degree Requirements

- Students who change degree programs and select this major must adopt the most current catalog.
- All mathematics courses except MAC 2311, MAC 2312, MAC 2313 and MAP 2302 must either be taken from, or approved by, the Department of Mathematics at UCF.
- 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 required course.
- Co-op or internship credit cannot be used in this major.
- Students should consult with a departmental advisor.
- Courses designated in sections 1 (General Education Program) and 2 (Common Program Prerequisites) are usually completed in the first 60 hours.

1. UCF General Education Program (36+2 hrs)

(Note: Certain courses must be selected for this major, bringing GEP hours above 36)

| | |
|--|-------|
| A. Communication Foundations | 9 hrs |
| B. Cultural and Historical Foundations | 9 hrs |
| C. Mathematical Foundations | |
| 1. Select MAC 2311 | 4 hrs |
| 2. Select COP 3502C | 3 hrs |
| D. Social Foundations | 6 hrs |
| E. Science Foundations | |
| 1. Select PHY 2048 & L | 4 hrs |
| 2. Select a listed course | 3 hrs |

2. Common Program Prerequisites (15 hrs)

| | | |
|------------|--------------------------------|-------|
| COP 3223* | Intro to Programming with C | 3 hrs |
| MAC 2311 | Calculus with Analytic Geo I | GEP |
| MAC 2312 | Calculus with Analytic Geo II | 4 hrs |
| MAC 2313 | Calculus with Analytic Geo III | 4 hrs |
| PHY 2048*L | Physics for Sci & Eng I w/lab | GEP |
| PHY 2049*L | Physics for Sci & Eng II w/lab | 4 hrs |

*See Transfer Notes for possible substitutes

See "Common Prerequisites" in the Transfer and Transitions Services section (pg. 46) for more information.

3. Basic Core Requirements (6 hrs)

| | | |
|-------------------|--------------------------------|-------|
| COP 3502C | Computer Science I | GEP |
| PHY 2048&L | Physics for Sci & Eng I w/lab | GEP |
| PHY 2049&L | Physics for Sci & Eng II w/lab | CPP |
| MAP 2302 | Differential Equations | 3 hrs |
| Select one course | | 3 hrs |
| STA 3032 | Prob. & Stats for Engineers | |
| STA 2023 | Statistical Methods I | |

4. Advanced Core Requirements (53 hrs)

| | | |
|-------------------|-----------------------------------|-------|
| Select one course | | 3 hrs |
| MHF 3302 | Logic and Proof in Mathematics | |
| COT 3100C | Intro to Discrete Structures | |
| Select one course | | 3 hrs |
| MAP 4103 | Mathematical Modeling I | |
| EML 3034 | Modeling Meth in Mech. & Aero Eng | |
| PHZ 3151 | Computer Methods in Physics | |
| MAP 4153 | Vector and Tensor Analysis | 3 hrs |
| MAP 4307 | Appl of Complex Variables | 3 hrs |
| MAP 4363 | Appl Boundary Value Prob I | 3 hrs |
| MAP 4364 | Appl Boundary Value Prob II | 3 hrs |
| MAA 4226 | Advanced Calculus I | 4 hrs |
| EGN 3321 | Engineering Analysis - Dynamics | 3 hrs |
| Select one course | | 3 hrs |
| EGN 3420 | Engineering Analysis | |
| COT 4500 | Numerical Calculus | |

| | | |
|---|---|---------|
| Select one course | | 3-4 hrs |
| MAS 3106 | Linear Algebra | |
| MAD 4203 | Applied Combinatorics | |
| Select one course | | 3 hrs |
| EGN 3310 | Engineering Analysis - Statics | |
| PHY 3220 | Mechanics I | |
| Select one course | | 3 hrs |
| EGN 3373 | Principles of Electrical Engineering | |
| PHY 3101 | Physics for Eng & Sci III | |
| Select one course | | 3 hrs |
| CHM 2046 | Chemistry Fundamentals II | |
| or any MAA, MAD, MAP, MAS, or MTG course at 3000 level or above | | |
| Select one course | | 3 hrs |
| EGN 3358 | Thermo-Fluids-Heat Transfer | |
| PHY 3513 | Thermal & Statistical Physics | |
| or any MAA, MAD, MAP, MAS, or MTG course at 3000 level or above | | |
| Select one course | | 3 hrs |
| EML 3701 | Fluid Mechanics | |
| CWR 3201 | Engineering Fluid Mechanics | |
| PHY 3101 | Physics for Eng & Sci III | |
| (PHY 3101 may be selected only if EGN3373 is also taken) | | |
| ESI 4628C | Industrial Engr Applications of Computers | |
| PHZ 3113 | Intro. to Theoretical Methods of Physics | |
| or any MAA, MAD, MAP, MAS, or MTG course at 3000 level or above | | |
| Select one course | | 3 hrs |
| EGN 3331 | Mechanics of Materials | |
| CHM 2046 | Chemistry Fundamentals II | |
| ESI 4312 | Operations Research | |
| EGM 3601 | Solid Mechanics | |
| EML 4220 | Vibration Analysis | |
| EEL 3004 | Electrical Networks | |
| PHY 4604 | Wave Mechanics I | |
| or any MAA, MAD, MAP, or MAS course at 3000 level or above | | |
| Select one course | | 3 hrs |
| CES 4100C | Structural Analysis I | |
| EGN 3331 | Mechanics of Materials | |
| EIN 3000 | Intro. to Indust. Eng. & Mngmnt Sys | |
| EAS 3101 | Fundamentals of Aerodynamics | |
| EGM 3601 | Solid Mechanics | |
| EEL 3004 | Electrical Networks | |
| or any PHY, PHZ, AST, MAA, MAD, MAP, or MAS course at 3000 level or above | | |

5. Restricted Electives (6 hrs)

| | | |
|--|---|-------|
| Select two courses | | |
| STA 4321 | Statistical Theory I | 3 hrs |
| STA 4322 | Statistical Theory II | 3 hrs |
| PHY 3323 | Electricity & Magnetism I | 3 hrs |
| PHY 4324 | Electricity & Magnetism II | 3 hrs |
| EGN 3365 | Structure & Property of Materials | 3 hrs |
| EGN 3613 | Engineering Economic Analysis | 2 hrs |
| EEE 3342C | Intro. to Digital Circuits and Systems | 3 hrs |
| EEL 3801 | Intro. to Computer Engineering | 3 hrs |
| EEL 3657 | Linear Control Systems | 3 hrs |
| EML 4142 | Heat Transfer | 3 hrs |
| EML 4312C | Feedback Control | 3 hrs |
| EML 3262 | Kinematics of Mechanisms | 3 hrs |
| EAS 4200 | Flight Structures | 3 hrs |
| EAS 4400 | Spacecraft Attitude Dynamics | 3 hrs |
| EAS 4505 | Orbital Mechanics | 3 hrs |
| EAS 4105 | Flight Mechanics | 3 hrs |
| EML 4703 | Fluid Mechanics II | 3 hrs |
| EMA 4223 | Fund. of Mechanical Behavior of Materials | 3 hrs |
| CWR 4203C | Hydraulics | 3 hrs |
| CWR 4101C | Hydrology | 3 hrs |
| ENV 4561 | Environmental Eng - Process Design | 4 hrs |
| ESI 4234 | Quality Engineering | 3 hrs |
| ESI 4523C | Systems Simulation | 3 hrs |
| EIN 4333C | Industrial Control Systems | 3 hrs |
| EEL 3470 | Electromagnetic Fields | 3 hrs |
| EEL 3552C | Analog & Digital Communication Fund. | 4 hrs |
| EEL 4750 | Digital Signal Processing Fund. | 3 hrs |
| EEL 4767C | Computer System Design I | 4 hrs |
| EEL 4832 | Eng. Applications of Computer Models | 3 hrs |
| EEL 4851C | Engineering Data Structures | 4 hrs |
| or any MAA, MAD, MAP, or MAS course at 3000 level or above | | |

6. Departmental Exit Requirements

- Earn a grade of "C" (2.0) or better in each course required in the degree program (sections 2-5 above).
- Participate in an exit interview.
- Computer Competency met by EGN 3420 or COP 3502C.
- Before applying to graduate, the CLAST must be completely satisfied.

7. Foreign Language Requirements

Admission: Two years high school, or one year college language (or equivalent proficiency exam) prior to graduation.

Graduation: none

8. Electives (variable)

Students desiring a double major in Engineering or Physics and Mathematics must also complete all requirements of both majors. Students should select electives which satisfy both majors simultaneously when possible.

9. 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 36 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, the CLAST, and nine hours of Summer credit (if applicable)

Total Semester Hours Required 120 hrs

Related Programs: Applied Mathematics, Computer Science, Engineering, Math Education, Statistics

Related Minors: Applied Computer Science, Computer Science, Engineering, Math, Physics, Statistics

Transfer Notes:

- Lower division courses taken at community colleges 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 common program prerequisites if taken prior to transferring to UCF:

- COP 3223*: may use any programming language course with a COP prefix.
- PHY 2048* & PHY 2049 with labs: may use any PHY, CHM or BSC course with a lab designed for science majors; however, PHY 2048 & PHY 2049 with labs are core requirements and still must be taken.

Program Academic Learning Compacts

- Program Academic Learning Compacts (student learning outcomes) for undergraduate programs are located at:
http://www.oegas.ucf.edu/alc/academic_learning_compacts.htm