

# AEROSPACE ENGINEERING MAJOR – Focus on Astronautical Engineering

## Program Tracking Sheet

Effective for students entering AY 2023-2024

Name:	Class Year:
Advisor:	2 <sup>nd</sup> Major:

**NOTES:** Minimum total academic credit = 15 units  
Residency Req.: Min. of 8 units must be completed at WPI

### HUMANITIES AND ARTS (6/3 unit)

#### Depth Component

Students must complete at least three thematically-related courses prior to the culminating Inquiry Seminar or Practicum in the same thematic area. At least one of the three courses should be at the 2000-level or above.

#### Breadth Component

Students must take at least one course outside the grouping in which they complete their depth component. To identify breadth, courses are grouped in the following manner.

- i. art/art history, drama/theatre, and music (AR, EN/TH, MU);
- ii. foreign languages (AB, CN, EN, GN, SP);
- iii. literature and writing rhetoric (EN, WR, RH);
- iv. history and international studies (HI, HU, INTL);
- v. philosophy and religion (PY, RE).

All 5 HUA courses must be completed before beginning the Inquiry Seminar or Practicum.

Exception: May take all six courses in a foreign language

	Course	Term	Grade	Units
1				1/3
2				1/3
3				1/3
4				1/3
5				1/3
6	HU 3900 or HU 3910			1/3

### WELLNESS AND PHYSICAL EDUCATION (4 WPE classes = 1/3 unit)

7				1/12
				1/12
				1/12
				1/12

### SOCIAL SCIENCE (2/3 unit) ECON, ENV, GOV, PSY, SD, SOC, SS, STS, DEV, and ID2050

8				1/3
9				1/3

### INTERACTIVE QUALIFYING PROJECT (3/3 unit)

10	IQP			1/3
11	IQP			1/3
12	IQP			1/3

### FREE ELECTIVES (3/3 unit)

13				1/3
14				1/3
15				1/3

### MATHEMATICS AND BASIC SCIENCES (10/3 units)

#### MATHEMATICS (6/3 unit) Courses with prefix: MA

16	MA 1021 (Calc 1)			1/3
17	MA 1022 (Calc 2)			1/3
18	MA 1023 (Calc 3)			1/3
19	MA 1024 (Calc 4)			1/3
20	MA 2051 (Diff Eqs)			1/3
21	MA 2071 Matrices and Linear Algebra			1/3

#### PHYSICS (2/3 unit) Courses with prefix: PH

22	PH 1110/1111 (Mechanics)			1/3
23	PH 1120/1121 (E&M)			1/3

#### CHEMISTRY (1/3 unit) Course with prefix: CH

24	CH 1010 (Chem 1) or 1020 (Chem 2)			1/3
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#### SPACE ENVIRONMENTS (1/3 unit)

25	PH 2550 Atmospheric and Space Env			1/3
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### Core Aerospace Engineering (11/3 units)

#### FLUID DYNAMICS (2/3 unit)

26	AE 2110 Intro to Incompressible Fluid Dynamics			1/3
27	AE 3110 Fund of Compressible Fluid Dynamics			1/3

#### PROPULSION AND ENERGY (2/3 units)

28	ES 3001 Intro to Thermodynamics			1/3
29	ES 3003 Heat Transfer			1/3

#### FLIGHT DYNAMICS AND CONTROLS (2/3 units)

30	ES 2503 Intro to Dynamic Systems			1/3
31	AE 2310 Intro to Control of Aerospace Systems			1/3

#### MATERIALS AND STRUCTURES (4/3 units)

32	ES 2001 Intro to Materials Science			1/3
33	AE 2410 Intro to Aerospace Structures			1/3
34	AE 3420 Fund of Aerospace Structures			1/3
35	AE 4410 Fund of Structural Dynamics			1/3

#### GENERAL ENGINEERING (1/3 unit)

36	ME 3901 Engineering Experimentation or ME 3902 Project-Based Engineering Experimentation			1/3
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### Astronautics Track (9/3 units)

#### PROPULSION AND ENERGY (1/3 unit)

37	AE 4220 Fund of Rocket Propulsion			1/3
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#### FLIGHT DYNAMICS and CONTROLS (3/3 units)

38	AE 2320 Intro to Orbital Mechanics			1/3
39	AE 3310 Fund of Navigation and Communication			1/3
40	AE 4320 Fund of Spacecraft Dynamics and Control			1/3

#### AEROSPACE DESIGN (4/3 unit)

41	AE 4520 Spacecraft and Mission Design			1/3
42	AE MQP			1/3
43	AE MQP			1/3
44	AE MQP			1/3

#### AERONAUTICS ELECTIVE (1/3 units)

45				1/3
Selected from one of the following courses: AE 3120 Fund of Aerodynamics AE 4210 Fund of Air-breathing Propulsion AE 3430 Fund of Composite Materials AE 4310 Fund of Aircraft Dynamics and Controls				

**COURSE SCHEDULE FOR HELP IN ACADEMIC PLANNING**

Note: For the most up to date information, please consult the Undergraduate Catalog and: <https://courselistings.wpi.edu/>

# AY 2023 - 2024

CURRICULAR AREAS
Fluid Dynamics
Propulsion and Energy
Flight Dynamics and Controls
Materials and Structures
Aerospace Design
General Engineering

[X, Y]: terms for a course with multiple offerings; (X, Y):Time, and Day for In-Person course;

(OL): course is offered OnLine asynchronously; (NO): course is Not Offered this year (alternates)

COURSE SCHEDULE					
	A Term	B Term	C Term	D Term	Summer Term
First Year	MA 1021 [A, B, C]	MA 1022 [A, B, C, D]	MA 1023 [A, B, C, D]	ES 2001 [A, B, C, D]	AE 2110 [E1] (OL)
	PH 1111 [A, C]	PH 1121 [B, D]	CH 1010 [A, C]	PH 2550 [D] (3)	AE 3110 [E1] (OL)
			Free Elect (CS 1004)	MA 1024 [A, B, C, D]	AE 3310 [E2] (OL)
Soph	AE 2410 (9)	AE 2110 (9)	AE 2320 (9)	AE 2310 (10)	
			AE 2320 L (2, 3, 4, R)	ES 3003 [A, B, D]	
	MA 2051 [A, B, C, D]	ME 3902 [A, B]	ES 3001 [A, B, C, D]	ME 3901 [C, D]	
	ES 2503 [A, B, C, D]	MA 2071 [A, B, C, D]			
Junior	AE 3110 (1)	AE 3420 (10)	AE 4310 (11)	AE 4410 (9)	
	AE 3310 (11)	AE 3120 (8)	AE 4320 (10)		
			Free Elect (ECE 2010)		
Senior	AE MQP	AE MQP	AE MQP		
	AE 4210 (9)	AE 4510 (11)	AE 3430 (9)		
	AE 4220 (10)	AE 4520 (9)			
Grad		AE 5134 Plasma Dyn (3, M, R) (OL) AE 5133 Kinetic Theory (NO)	AE 5131 Incomp Fluids (1, T, R) (OL)	AE 5132 Comp Fluids (1, T, R) (OL)	
	AE 5234 Sustainable (1, T, R) (OL)		AE 5231 AirBreatProp (3, T, R) AE 5233 Combustion (NO)	AE 5232 Spacecraft Prop (3, M, R)	AE 5234 [E1] (OL)
	AE 5333 Optimal Control (1, M, W) (OL) AE 5334 Spacecraft Dynamics (NO)	AE 5335 Autonomous Control (NO)	AE 5331 Linear Contr (3, M, W) (OL)	AE 5332 Non-Linear Control (1, T, F)	AE 6098 (OL)
	AE 5434 Comp Sol Mech (3, M, W) (OL)	AE 5435 Frac Mech (1, M, W) (OL)	AE 5431 Solid Mech (12, M, W) (OL)	AE 5432 Composite (NO)	
		AE 5031 Comp Meth (1, T, R) (OL)			
	AE 5032 Seminar (3, F) (OL)	AE 5032 Seminar [NK] (3, F)(OL)	AE 5032 Seminar (3, F)(OL)	AE 5032 Seminar (3, F) (OL)	