

AER E Technical Electives List

Students with a catalog year prior to 2021-22 must take 12 Technical Elective credit hours from the following three groups/categories (3 credit hours of A-Tech Electives, 3 credit hours of B-Tech Electives, 6 credit hours of C-Tech Electives)

Students with a catalog year of 2021-22 or newer are only required to take 9 Technical Elective credit hours from the following three groups/categories (3 credit hours of A-Tech Electives, 3 credit hours of B-Tech Elective, 3 credit hours of C-Tech Electives)

Group A.) Aerospace – 3 credit hours needed (Please Note: not all Group A Technical Electives are offered every semester)

- any AER E or EM graduate level (500+ level) courses
- AER E 407 Applied Formal Methods
- AER E 412 Propulsion
- AER E 415 Rocket Propulsion*
- AER E 417 Experimental Mechanics
- AER E 422 Structures
- AER E 423 Composites
- AER E 426 Design/Structures
- AER E 432 Controls
- AER E 433 Spacecraft Dynamics/Control*
- AER E 442 V/STOL
- AER E 446 Comp. Fluid Dynamics
- AER E 448 Fluid Dyn. Of Turbo Mach.
- AER E 451 Astrodynamics
- AER E 452 Intro to Systems Engineering & Analysis
- AER E 463 Intro to Multi-disciplinary Design Optimization
- AER E 464 Spacecraft Systems
- AER E 468 Large Scale Complex Eng. Syst.
- AER E 471 Aviation Safety & Piloting
- AER E 480 Ultrasonic Nondestructive Evaluation
- AER E 481 Wind Energy
- AER E 483 Aeroacoustics

***Please Note:** For students on the 2021-22 catalog or newer, only one of AER E 415/AER E 433 can be applied as Technical Elective credit, the other must be taken as a core course requirement for graduation.

Group B.) Technical/Engineering – 3 credits needed

- any additional course from Group A listed above
- AER E 381 Intro to Wind Energy
- AER E 490 Aerospace Engineering Independent Study/Research**
- AER E 494 Make To Innovate (M2I)**
- ASTRO 342 Intro to Solar System Astronomy
- ASTRO 346 Intro to Astrophysics
- EE 314 Electromagnetics for Non-Electrical Engineers

- IE 305 Engineering Economic Analysis
- IND D 340 Computer Aided Design (SolidWorks) (previously numbered IND D 341)
- MATH 365 Complex Variables
- MATH 385 Intro to Partial Differential Equations
- MATH 414 Analysis I
- MATH 481 Numerical Methods for Differential Equations
- PHYS 306 Physics of Wave Motion
- PHYS 321 Intro to Modern Physics I
- PHYS 361 Classical Mechanics
- STAT 305 Engineering Statistics
- STAT 341 Intro to Theory of Probability & Statistics
- any 300-level or above course in the College of Engineering (must first be approved by AER E Curriculum Committee – EE 351, MAT E 311, ENGR 350, & AER E/ME 318X will not count as a Tech Elective)

****Please Note:** a maximum of six credit hours of 490 Independent Study credit (from any department) & AER E 494 credit (Make To Innovate) can be applied to a student's degree audit for graduation

Group C.) Career – 6 credits needed (prior to 2021-22 catalog), 3 credits needed (2021-22 catalog or newer)

- any additional course from Group A or Group B listed above
- AFAS 341 Air Force Leadership Studies I
- AFAS 342 Air Force Leadership Studies II
- N S 320 Naval Ship Systems I
- N S 330 Naval Ship Systems II
- any course 300-level or above from the Iowa State University catalog that is relevant to a student's statement of career goals and objectives. Students will need to type up a document that includes their statement of career goals, how the course ties into those goals, and how it will help the student achieve those goals. That document will need to be submitted to the student's assigned academic adviser and possibly the AER E Curriculum Chair for review.