Course Offerings | *Course offerings subject to change pending enrollment and instructor availability*																	
				2026	2027	2027	2027	2028	2028	2028	2029	2029	2029	2030	2030
Course Number	Slash / Cross Listed	Description	Hours	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer
AEM 121		**Intro to Aerospace Engineering**	1	X			X			X			X		
ENGR 104		**Foundations in Engineering**	3	X	X		X	X		X	X		X	X	
AEM 201		**Statics**	3	X	X	X	X	X	X	X	X	X	X	X	X
AEM 249		**Algorithms**	3	X	X		X	X		X	X		X	X	
AEM 250		**Mechanics of Materials**	3	X	X	X	X	X	X	X	X	X	X	X	X
AEM 251		**Mechanics of Materials Laboratory**	1	X	X	X	X	X	X	X	X	X	X	X	X
AEM 264		**Dynamics**	3	X	X	X	X	X	X	X	X	X	X	X	X
AEM 311		**Fluid Mechanics**	3	X	X	X	X	X	X	X	X	X	X	X	X
AEM 313		**Aerodynamics**	3	X	X		X	X		X	X		X	X	
AEM 341		**Aerospace Structures**	3	X	X		X	X		X	X		X	X	
AEM 351		**Aerospace Structures Laboratory**	1	X	X		X	X		X	X		X	X	
AEM 360		Astronautics	3	X											
AEM 368		**Flight Mechanics**	3		X	X		X	X		X	X		X	X
AEM 395		**Professional Development**	3	X			X	X		X	X		X	X	
AEM 402		**Integrated Aerospace Design I**	3	X			X			X					
AEM 403		**Integrated Aerospace Design I**	3							X			X		
AEM 404		**Integrated Aerospace Design II**	3		X			X			X			X	
AEM 408		**Propulsion Systems**	3	X			X			X			X		
AEM 413		**Compressible Flow**	3		X	X		X	X		X	X		X	X
AEM 420		**CFD**	3	X			X			X			X		
AEM 451		**Aircraft Structural Design (elective in F25 catalog)**	3		X			X			TBD		Restructure		
AEM 461		**Computational Methods for Aerospace Strucutres**	3		X			X			X			X	
AEM 468		**Flight Dynamics & Control**	3	X			X			X			X		
AEM 491/492		Special Problems	1-6	Instructor/advisor approved											
AEM 493		Special Topics	1-3	Instructor/advisor approved											
AEM 496/497		Honors Special Topics	3	Instructor/advisor approved											
AEM 500		Intermediate Fluid Mechanics	3		X			X			X			X	
AEM 508		Propulsion Systems (Grad)		X			X			X			X		
AEM 513		Compressible Flow (Grad)			X	X		X	X		X	X		X	X
AEM 514	AEM 414	Experimental Aerodynamics	3	X						X					
AEM 516	AEM 416	Helicopter Theory	3		X						X				
AEM 518/GY 522		Uncrewed Aircraft Systems (GY even years)	3		?			X			X			X	
AEM 520		CFD	3					X						X	
AEM 525	AEM 425	Spacecraft Dynamics and Control	3		X						X				
AEM 528	AEM 428	Space Propulsion	3					X						X	
AEM 530		Continuum Mechanics	3				X						X		
AEM 535		Applied FEM	3	X						X					
AEM 546	AEM 446	Intermediate Solid Mechanics	3		X			X			X			X	
AEM 548	AEM 448	Stochastic Mechanics	3	X						X					
AEM 552	AEM 452	Composite Materials	3	X						X					
AEM 553	AEM 453	Multi-Scale Analysis: Composites	3					X						X	
AEM 555	AEM 455	Non-Destructive Evaluation	3				X						X		
AEM/ME 562		Intermediate Dynamics (ME even years)	3	X			X			X			X		
AEM 566		Optimal Control and Estimation	3	X						X					
AEM 569	AEM 469	Orbital Mechanics	3				X						X		
AEM 574	AEM 474	Structural Dynamics	3	X						X					
AEM 575	AEM 475	Fundamentals of Aeroelasticity	3		X						X				
AEM 582	AEM 482	Space Systems	3	X						X					
AEM 584	AEM 484	Space Environments	3				X						X		
AEM 589	AEM 489	Space Law	3					X						X	
AEM 591/592		Special Problems	1-6	Instructor/advisor approved											
AEM 593		Special Topics (P/F)	3	Instructor/advisor approved											
AEM 594		Special Projects	1-6	Instructor/advisor approved											
AEM 598		Non-Thesis Research	1-3	Instructor/advisor approved											
AEM 599		Thesis Research	1-12	Instructor/advisor approved											
AEM 606		Physical Gas Dynamics	3				X						X		
AEM 614		Airfoil & Wing Theory	3					X						X	
AEM 616		Rotorcraft Aeromechanics	3												
AEM 621		Viscous Flow	3				X						X		
AEM 622		Turbulent Flow	3		X						X				
AEM 624		Hypersonic Flow	3	X						X					
AEM 635		Finite Element Methods	3				X						X		
AEM 637		Theory of Elasticity	3					X						X	
AEM 638		Introduction Experimental Mechanics	3		X						X				
AEM 644		Engineering Fracture Mechanics	3							X					
AEM 648		Theory of Plasticity	3	X									X		
AEM 649		Fatigue Analysis	3				X								
AEM 655		Advanced Composite Materials	3		X						X				
AEM 662		Multi-Body Dynamics	3					X						X	
AEM 667		Navigation and Target Tracking	3				X						X		
AEM 668		Advanced Flight Dynamics & Control	3		X						X				
AEM 669		Advanced Astrodynamics	3					X						X	
AEM 675		Advanced FEA	3					X						X	
AEM 685		Engineering Optimization	3				X						X		
AEM 691		Special Problems	3	Instructor/advisor approved											
AEM 693		Special Topics (P/F)	3	Instructor/advisor approved											
AEM 694		Special Project	1-6	Instructor/advisor approved											
AEM 698		Non-Dissertation Research	1-3	Instructor/advisor approved											
AEM 699		Dissertation Research	1-12	Instructor/advisor approved											
GES 551		Matrix & Vector Analysis	3	X		X	X		X	X		X	X		X
GES 554		PDE	3		X	X		X	X		X	X		X	X
GES 555		Nonlinear PDE	3				TBD						TBD		

KEY

Bold	BSAE required
	Grad Mechanics Core Course
	Grad Math Core Course
	TBD or Upon Sufficient Resources/Demand

Notes:

- Consult appropriate year catalog for curriculum requirements

- All courses require sufficient enrollment to be offered

Course Descriptions:

https://catalog.ua.edu/undergraduate/engineering/aerospace-mechanics/courses/

https://catalog.ua.edu/graduate/engineering/aerospace-mechanics/#coursestextcontainer

Program Requirements:

https://catalog.ua.edu/undergraduate/engineering/aerospace-mechanics/bs/#text

https://catalog.ua.edu/graduate/engineering/aerospace-mechanics/#programs

Core	**Mechanics (3 hours)**
	AEM 500 Intermediate Fluid Mechanics
	AEM 546 Intermediate Solid Mechanics
	AEM/ME 562 Intermediate Dynamics
	Math (3 hours)
	GES 551 Matrix and Vector Analysis
	GES 554 Partial Differential Equations
	AEM 548 Stochastic Mechanics

	Aerodynamics/Fluids	**Aero-structures/Solids**
Courses relevant to Areas of Interest	AEM 500 Intermediate Fluid Mechanics	AEM 530 Continuum Mechanics
	AEM 508 Propulsion	AEM 535 Applied FEM
	AEM 513 Compressible Flow	AEM 546 Intermediate Solid Mechanics
	AEM 514 Experimental Aerodynamics	AEM 548 Stochastic Mechanics
	AEM 516 Helicopter Theory	AEM 552 Composite Materials
	AEM 520 CFD	AEM 553 Multi-scale Analysis: Composites
	AEM 530 Continuum Mechanics	AEM 555 Non-destructive Evaluation
	AEM 548 Stochastic Mechanics	AEM 574 Structural Dynamics
	AEM 575 Aeroelasticity	AEM 575 Aeroelasticity
	AEM 606 Physical Gas Dynamics	AEM 635 Finite Element Methods
	AEM 614 Airfoil and Wing Theory	AEM 637 Elasticity
	AEM 616 Rotorcraft Aeromechanics	AEM 638 Introduction to Experimental Mechanics
	AEM 621 Viscous Flow	AEM 644 Engineering Fracture Mechanics
	AEM 622 Turbulent Flow	AEM 648 Theory of Plasticity
	AEM 624 Hypersonic Flow	AEM 649 Fatigue Analysis
		AEM 655 Advanced Composite Materials
		AEM 675 Advanced FEA
		AEM 685 Engineering Optimization
	Dynamics/Control/Guidance/Navigation	**Space Systems/Propulsion**
	AEM 518 Uncrewed Aircraft Systems	AEM 500 Intermediate Fluid Mechanics
	AEM 525 Spacecraft Dynamics and Control	AEM 508 Propulsion
	AEM/ME 562 Intermediate Dynamics	AEM 525 Spacecraft Dynamics and Control
	AEM 566 Optimal Control and Estimation	AEM 528 Space Propulsion
	AEM 569 Orbital Mechanics	AEM/ME 562 Intermediate Dynamics
	AEM/ME 570 Mechanical Vibrations	AEM 566 Optimal Control and Estimation
	AEM 574 Structural Dynamics	AEM 569 Orbital Mechanics
	AEM 575 Aeroelasticity	AEM 582 Space Systems
	AEM 616 Rotorcraft Aeromechanics	AEM 584 Space Environment
	AEM 662 Multi-body Dynamics	AEM 589 Space Law
	AEM 667 Navigation and Targeting Tracking	AEM 662 Multi-body Dynamics
	AEM 668 Advanced Flight Dynamics and Control	AEM 669 Advanced Astrodynamics
	AEM 669 Advanced Astrodynamics	AEM 685 Engineering Optimization
	AEM 685 Engineering Optimization	

	Common Math-credit Courses	**Common Electives**
Common Math and Elective Courses	GES 500 or ST 560 or MATH 551 or MATH 554: *Courses in statistics*	ME 509 Intermediate Heat Transfer
	GES 551 Matrix and Vector Analysis	ME 511 Computational Heat Transfer and Fluid Flow
	GES 553 Ordinary Differential Equations	ME 514 Principles of Combustion
	GES 554 Partial Differential Equations	ME 517 Sustainable Energy
	GES 555 Nonlinear PDE	ME 520 Gas Turbines
	AEM 548 Stochastic Mechanics	ME 540 Failure of Engineering Materials
	ME 501 Mechanical Engineering Analysis	ME 570 Mechanical Vibrations
	ST 531 Data Mining	ME 571 Foundamental of Acoustics
	ST 561 Applied Design of Experiments	ME 575 Control Systems Analysis
	MATH 511 Numerical Analysis I	ME 577 Advanced Linear Controls
	MATH 520 Linear Optimization Theory	ME 583 Additive Manufacturing
	MATH 572 Linear Algebra	
	MATH 583 Complex Analysis I	
	Some courses may have pre-requisites. Consult with the course home department. Other courses may be suitable for elective credit if relevant to our program. Consult with your research advisor. Most engineering and science related programs at UA do not have a distance program, thus their courses are not available for our distance students.	

Key

	Mechanics Core Course
	Math Core Course