Mechanical Engineering

Course #	Course Name	Pre-Req*	Summer	Fall	Spring		
Core Cours	es						
535.641	Mathematical Methods for Engineers	Vector analysis & differential equations	0	0	0		
Recommen	Recommended Courses						
535.609	Topics in Data Analysis		0	0	0		
535.610	Computational Methods of Analysis		0	0	0		
535.742	Applied Machine Learning for Mechanical Engineers		0	0	0		
535.742	Intermediate Applied Artificial Intelligence in Mechanical Engineering		0	0	0		
535.766	Numerical Methods			U	0		
				- "			
Course #	Course Name	Pre-Req*	Summer	Fall	Spring		
	Manufacturing Focus Area - Group 1		ı	ı			
535.628	Computer-Integrated Design and Manufacturing			_	0		
535.659	Manufacturing Systems Analysis			0			
535.660	Precision Mechanical Design		_	0	0		
535.673	Mechanized Assembly: Hardware and Algorithms		0				
Advanced I	Manufacturing Focus Area - Group 2						
535.606	Advanced Strength of Materials				0		
535.607	Mechanics of Solids and Structures: Theory and Applications I			0			
535.618	Fabricatology - Advanced Materials Processing			0	0		
535.623	Intermediate Vibrations	Undergraduate vibrations course		0	0		
535.627	Computer-Aided Design		0	0	0		
535.633	Intermediate Heat Transfer	Undergraduate heat transfer course			0		
535.638	Mechanical Packaging for Electronics Systems		0	0			
535.642	Control Systems for Mechanical Engineering Applications			0			
535.671	Aerospace Materials, Structures and Design		TBC	*in developn	nent		
535.672	Advanced Manufacturing Systems		0				
535.684	Modern Polymeric Materials			0			
535.720	Mechanics of Composite Materials and Structures			0	0		
535.721	Advanced Composite Materials & Manufacturing Processes			0	0		
515.601	Structure and Properties of Materials						
515.622	Micro and Nano Structured Materials and Devices		Soo Matoria	ls Science and	Enginooring		
515.655	Metal Additive Manufacturing			fering page fo			
515.658	Design for Additive Manufacturing	515.655	<u>course or</u>	rering page to	Scriedule		
515.661	Introduction to Polymer Science						
Aerospace	Engineering Focus Area - Group 1						
535.606	Advanced Strength of Materials				0		
535.607	Mechanics of Solids and Structures: Theory and Applications I			0			
535.612	Intermediate Dynamics			0			
535.620	Fluid Dynamics I				0		
535.623	Intermediate Vibrations	Undergraduate vibrations course		0	0		
535.670	Advanced Aerodynamics			0			
535.752	Advanced Flight Dynamics and Control of Aerospace Vehicles			0			
535.761	Hypersonic Aerothermodynamics				0		
Aerospace	Engineering Focus Area - Group 2						
535.608	Hypersonic Technologies and Systems			0			
535.625	Turbulence			VL (odd years)			
535.627	Computer-Aided Design		0	O (oud years)	0		
535.628	Computer-Integrated Design and Manufacturing				0		
535.632	Applied Finite Elements		0	0	0		
535.642	Control Systems for Mechanical Engineering Applications		<u> </u>	0	-		
535.643	Plasticity				0		
535.652	Thermal Systems Design and Analysis			0	-		
535.660	Precision Mechanical Design			0	0		
535.671	Aerospace Materials, Structures and Design		TBC	*in developn			
535.684	Modern Polymeric Materials				0		
535.706	Mechanics of Solid Structures: Theory and Applications II				0		
535.720	Mechanics of Composite Materials and Structures			0	0		
535.721	Advanced Composite Materials & Manufacturing Processes			0	0		
535.724	Dynamics of Robots and Spacecraft				0		
	1 ,	1					

^{*}See catalog of complete list and description of prerequisites

Mechanical Engineering

Course #	Course Name	Pre-Req*	Summer	Fall	Spring	
535.731	Engineering Materials: Properties and Selection			0	0	
535.732	Fatigue and Fracture of Materials				0	
535.735	Computational Fluid Dynamics			0		
535.741	Optimal Control and Reinforcement Learning				0	
535.752	Advanced Flight Dynamics and Control of Aerospace Vehicles			0		
535.761	Hypersonic Aerothermodynamics				0	
515.655	Metal Additive Manufacturing				*	
515.658	Design for Additive Manufacturing		Soo program C	ourse Offering n	aga for schodule	
515.661	Introduction to Polymer Science		See program Course Offering page for schedul			
525.609	Continuous Control Systems		515.XXX - M	aterials Science	& Engineering	
525.645	Modern Navigation Systems					
525.661	UAV Systems and Control		525.XXX - Electrical & Computer Engineering			
525.777	Control System Design Methods					
Biomecha	nical Engineering Focus Area - Group 1					
535.661	Biofluid Mechanics	T		0		
535.663	Biosolid Mechanics				0	
535.667	Biomechanics of Human Movement			0	0	
	Biomechanics of the cell: From nano- and micro-mechanics to cell					
535.750	organization and function			0	0	
585.601	Physiology for Applied Biomedical Engineering		See Applied B	iomedical Engi	neering Course	
585.631	Introduction to Biomechanics		Offering page for schedule			
Biomecho	nical Engineering Focus Area - Group 2					
535.607	Mechanics of Solids and Structures: Theory and Applications I	T		0		
535.664	Fundamental Principles for Bio-microfluidic Systems		TBC	*in developi	ment	
535.720	Mechanics of Composite Materials and Structures		1	0	I	
515.606	Chemical and Biological Properties of Materials	Undergraduate chemistry & biology			I	
525.786	Human Robotics Interaction	Linear algebra, differential equations	_			
585.631	Introduction to Biomechanics	zinear algebra) amerendar equations	See program C	ourse Offering p	age for schedule	
585.708	Biomaterials		E1E VVV M	aterials Science	9. Enginooring	
585.710	Biochemical Sensors		<u>313.888 - WI</u>	ateriais Science	& Liigiiieeiiiig	
585.720	Orthopedic Biomechanics	585.601 and 585.602	525.XXX - Ele	ctrical & Compu	ter Engineering	
585.726	Biomimetrics in Biomedical Engineering	5651661 4114 5651662				
585.729	Cell and Tissue Engineering	Ordinary differential equations	585.XXX - A	oplied Biomedica	al Engineering	
585.747	Advances in Cardiovascular Medicine	585.601 and 585.602	_			
	hanics and Thermal Science Focus Area - Group 1	555.652 4.14 555.652				
535.620	Fluid Dynamics I			0		
535.621	Intermediate Fluid Dynamics	Undergraduate fluid mechanics course		U	0	
535.633	Intermediate Heat Transfer	onder graduate ridio mechanics course			0	
535.634	Applied Heat Transfer	Undergraduate heat transfer course	0			
535.735	Computational Fluid Dynamics	onucigiaudate neat transfer course		0		
	,				1	
515.602	Thermodynamics and Kinetics of Materials		See program Course Offering page for schedule			
575.601	Fluid Mechanics		515.XXX - Materials Science & Engineering 575.XXX - Environmental Engineering 615.XXX - Applied Physics			

Mechanical Engineering

Course #	Course Name	Pre-Req*	Summer	Fall	Spring	
535.614	Fundamentals of Acoustics	· ·			0	
				VL		
535.625	Turbulence	535.620		(odd years)		
535.652	Thermal Systems Design and Analysis	Undergraduate courses in		0		
333.032	Thermal Systems besign and Analysis	thermodynamics & heat transfer		Ů		
535.661	Biofluid Mechanics			0		
535.662	Energy and Environment				0	
535.664	Fundamental Principles for Bio-microfluidic Systems		TBC	*in developr	ment	
535.670	Advanced Aerodynamics	535.620		0		
535.737	Multiscale Modeling and Simulation of Mechanical Systems		0			
535.761	Hypersonic Aerothermodynamics				0	
535.771	Naval Architecture Design		TBC	*in developr	ment	
535.773	Acoustical Oceanography			0		
515.622	Micro and Nano Structured Materials and Devices		See program Course Offering page for schedul			
565.680	Marine Geotechnical Engineering		515.XXX - Materials Science & Engineering 565.XXX - Civil Engineering			
Hyperson	ic Technologies Focus Area - Group 1					
535.608	Hypersonic Technologies and Systems			0		
535.721	Advanced Composite Materials & Manufacturing Processes			0	0	
535.734	Ultra-high Temperature Materials		TBD	*in developr	ment	
535.752	Advanced Flight Dynamics and Control of Aerospace Vehicles			0		
535.761	Hypersonic Aerothermodynamics				0	
Hyperson	ic Technologies Focus Area - Group 2					
535.620	Fluid Dynamics I		1	I	0	
535.627	Computer-Aided Design		0	0	0	
535.633	Intermediate Heat Transfer	Undergraduate heat transfer course		Ŭ	0	
535.634	Applied Heat Transfer	Undergraduate heat transfer course	0		, J	
535.670	Advanced Aerodynamics			0		
535.671	Aerospace Materials, Structures and Design		TBC	*in developr	nent	
535.735	Computational Fluid Dynamics			0		
575.601	Fluid Mechanics			ental Engineering page for schedule		
Ocean En	gineering Focus Area - Group 1					
535.606	Advanced Strength of Materials				0	
535.607	Mechanics of Solids and Structures: Theory and Applications I			0		
535.620	Fluid Dynamics I				0	
535.621	Intermediate Fluid Dynamics	Undergraduate fluid mechanics course			0	
615.761	Intro to Oceanography		See Applied F	Physics Course Of	fering page for	
				schedule		
	gineering Focus Area - Group 2	T	<u> </u>	1	0	
535.614	rundamentals of Acoustics			VL	0	
535.625	Turbulence	535.620		(odd years)		
535.627	Computer-Aided Design		0	0	0	
535.632	Applied Finite Elements		0	0	0	
535.721	Advanced Composite Materials & Manufacturing Processes			0	0	
535.732	Fatigue and Fracture of Materials				0	
535.735	Computational Fluid Dynamics			0		
535.771	Naval Architecture Design		TBC	*in developr	nent	
535.773	Acoustical Oceanography			0		
525.645	Modern Navigation Systems		See program Course Offering page for schedule			
565.680	Marine Geotechnical Engineering		525.XXX - Electrical and Computer Engineering			
565.682	Design of Ocean Structures		565.XXX - Civil Engineering			
615.775	Physics of Climate		615.XXX - Applied Physics			
Robotic, L	Dynamics, and Controls Focus Area - Group 1					
535.622	Robot Motion Planning		0		0	
535.630	Kinematics and Dynamics of Robots			0	0	
535.642	Control Systems for Mechanical Engineering Applications			0		
535.724	Dynamics of Robots and Spacecraft				0	

^{*}See catalog of complete list and description of prerequisites

Mechanical Engineering

Section Sect	Course #	Course Name	Pre-Req*	Summer	Fall	Spring
25.500	535.752	Advanced Flight Dynamics and Control of Aerospace Vehicles			0	
See programs Course Offenine page for Sections See programs Course Offenine page for Sections See Sections Sec						1
S25.665 Feedback Control in Biological Signaling Pathways S25.669 S25.660 S25.669 S2		,		See progran	n Course Offe	ering page for
\$25.65 Modern Newigation Systems and Control \$25.609 \$25.000		·				
525.503 UNX Systems and Control 525.009 525.000						
Section Sect	525.661		525.609	525.XXX -	Electrical and	Computer
Section Sect		·				
Bookstic Dynamics, and Controls Focus Area - Group 2		, ,	Linear algebra, differential equations			,
Robotic, Dynamics, and Controls Focus Area - Group 2	605.613	Introduction to Robotics		605.XX	X - Computer	Science
Sab Solid Intermediate Dynamics Nathematics through calculus & linear sligebra O O O O O O O O O	605.716	Modeling and Simulation of Complex Systems		1		
Sas. 6.12 Intermediate Dynamics Sas. 6.12 Intermediate Wirations Undergraduate wibrations course O O O O O O O O O O O O O O O O O O	Robotic, D	ynamics, and Controls Focus Area - Group 2				
15.5.6.12 Intermediate Unhamics John	535.603	Applied Optimal Control			VL	
Sas. 622 Intermediate Vibrations	535.612	Intermediate Dynamics	_		0	
Sas. 527 Computer - Aided Design O O O O O O O O O O	535.623	Intermediate Vibrations			0	0
Sas. Sas Computer-Integrated Design and Manufacturing Nathematics through calculus & linear algebra APL				0		
Introduction to Mechatronics Mathematics through calculus & linear algebra						0
S35.68			S .			
S35.655 Digital Control and Systems Applications S35.642 O	535.638	Mechanical Packaging for Electronics Systems		0	0	
S35.659 Manufacturing Systems Analysis 0 0 0 0 0 0 0 0 0			535.642	1	Ŭ	
S35.660 Precision Mechanical Design O O O O					0	
S35.733	-					0
S35.741 Optimal Control and Reinforcement Learning S35.641 O S35.782 Haptic Applications Some Biodicists and Audonocomous Systems Some Biodicists and Structures Solidas/Mechanics of Materials Focus Area - Group 1		ÿ		0		
See Nobotics and Autonomous Systems October			535.641			0
See Relation of Sensing Systems See Relation and Autonomous systems Contract Officing pages for schedule	535.782			0		
Solids/Mechanics of Materials Focus Area - Group 1 535.606	665.681					
S35.606 Advanced Strength of Materials O S35.607 Mechanics of Solids and Structures: Theory and Applications O O O O O O O O O		1 2		Offic	ering page for sch	<u>edule</u>
Sass.607 Mechanics of Solids and Structures: Theory and Applications Undergraduate vibrations course O O O O O O O O O	_				<u> </u>	0
Intermediate Vibrations		<u> </u>		+	0	0
Applied Finite Elements Designering Materials: Properties and Selection Solids/Mechanics of Materials Focus Area - Group 2 Sasting Intermediate Dynamics Intermediate Dynamics Intermediate Dynamics Sasting - Advanced Materials Processing Intermediate Dynamics Sasting - Advanced Materials Processing Intermediate Dynamics Sasting - Advanced Materials Processing Intermediate Dynamics Sasting - Advanced Materials Processing Sasting - O O O O O O O O O O O O O O O O O O		,	Undergraduate vibrations course	+		0
Engineering Materials: Properties and Selection O O O			Ondergraduate vibrations course			
Solids/Mechanics of Materials Focus Area - Group 2 535.612 Intermediate Dynamics Alagebra Babera Ba		• • • • • • • • • • • • • • • • • • • •		0		+
Intermediate Dynamics Mathematics through calculus & linear algebra O						
Sas.612 Intermediate Dynamics algebra O	Solius/ Ivie	Litatics of Materials Focus Area - Group 2	Mathematics through calculus 9 linear	1	Ī	T T
535.627 Computer-Aided Design 535.643 Plasticity 535.660 Precision Mechanical Design 535.660 Precision Mechanical Design 535.660 Precision Mechanics 535.660 Precision Mechanics 535.660 Precision Mechanics 535.661 Aerospace Materials, Structures and Design 535.671 Aerospace Materials, Structures and Design 535.684 Modern Polymeric Materials 535.706 Mechanics of Solids and Structures: Theory and Applications II 535.720 Mechanics of Composite Materials and Structures 535.721 Advanced Composite Materials & Manufacturing Processes 535.722 Fatigue and Fracture of Materials 535.732 Fatigue and Fracture of Materials 535.733 Stress Waves, Impacts and Shockwaves 535.734 Stress Waves, Impacts and Shockwaves 535.735 Structure and Properties of Materials 535.602 Thermodynamics and Kinetics of Materials 535.603 Thermodynamics and Kinetics of Materials 535.604 Chemical and Biological Properties of Materials 535.607 Chemical and Biological Properties of Materials 535.627 Chemistry of Nanomaterials 535.628 Micro and Nano Structured Materials and Devices 535.639 Metal Additive Manufacturing 535.630 Design for Additive Manufacturing 535.631 Introduction to Polymer Science		,	_			
535.643 Plasticity 535.666 O Precision Mechanical Design O O O S35.666 Precision Mechanical Design O O O O O O O O O O O O O O O O O O O						
535.660 Precision Mechanical Design 0 0 0 535.663 Biosolid Mechanics 0 0 0 535.663 Biosolid Mechanics 0 0 0 535.663 Biosolid Mechanics 0 0 0 535.671 Aerospace Materials, Structures and Design TBD *in development 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				0	0	+
Sister Sister Structure and Properties of Materials Sister Sis		•	535.606			
S35.671 Aerospace Materials, Structures and Design TBD *in development O S35.706 Mechanics of Solids and Structures: Theory and Applications II S35.700 Mechanics of Composite Materials and Structures Mechanics of Composite Materials & Manufacturing Processes Advanced Composite Materials & Manufacturing Processes Fatigue and Fracture of Materials Stress Waves, Impacts and Shockwaves Stress Waves, Impacts and Shockwaves Structure and Properties of Materials Structure and Properties of Materials Structure and Biological Properties of Materials S15.601 Chemical and Biological Properties of Materials S15.611 Computational Molecular Dynamics S15.612 Micro and Nano Structured Materials and Devices S15.625 Chemistry of Nanomaterials S15.626 Metal Additive Manufacturing S15.658 Design for Additive Manufacturing S15.651 Introduction to Polymer Science TBD *in development O S35.708 TBD *in development O O S35.708 O Undergraduate courses in materials & O Undergraduate courses in materials & O VL (even years) VL (even years) See program Course Offering page for schedule Schedule S15.627 Chemistry of Nanomaterials S15.628 Design for Additive Manufacturing S15.658 Design for Additive Manufacturing S15.659 S25.XXX - Electrical and Computer Finging Page Introduction to Polymer Science					0	
535.684 Modern Polymeric Materials 535.706 Mechanics of Solids and Structures: Theory and Applications II 535.720 Mechanics of Composite Materials and Structures 535.721 Advanced Composite Materials & Manufacturing Processes 535.732 Fatigue and Fracture of Materials 535.734 Stress Waves, Impacts and Shockwaves 535.748 Stress Waves, Impacts and Shockwaves 515.601 Structure and Properties of Materials 515.602 Thermodynamics and Kinetics of Materials 515.605 Chemical and Biological Properties of Materials 515.611 Computational Molecular Dynamics 515.612 Micro and Nano Structured Materials and Devices 515.622 Micro and Nano Structured Materials and Devices 515.625 Metal Additive Manufacturing 515.655 Metal Additive Manufacturing 515.658 Design for Additive Manufacturing 515.661 Introduction to Polymer Science						
Sas.706 Mechanics of Solids and Structures: Theory and Applications II Sas.606 recommended O O O		-		TBD	·	ment
Sabara S		,		1	0	_
535.731 Advanced Composite Materials & Manufacturing Processes Fatigue and Fracture of Materials Undergraduate courses in materials & mechanics Uldergraduate courses in materials & mechanics VL (even years) Stress Waves, Impacts and Shockwaves Structure and Properties of Materials Structure and Properties of Materials S15.602 Thermodynamics and Kinetics of Materials S15.606 Chemical and Biological Properties of Materials S15.607 Computational Molecular Dynamics S15.610 Nanomaterials S15.622 Micro and Nano Structured Materials and Devices S15.625 Metal Additive Manufacturing S15.655 Metal Additive Manufacturing S15.656 Introduction to Polymer Science		,	535.606 recommended	1		
Fatigue and Fracture of Materials Undergraduate courses in materials & mechanics O Stress Waves, Impacts and Shockwaves Stress Waves, Impacts and Shockwaves Structure and Properties of Materials Thermodynamics and Kinetics of Materials Str.602 Thermodynamics and Kinetics of Materials Undergraduate chemistry & biology See program Course Offering page for schedule See program Course Offering page for schedule See program Course Offering page for schedule Str.617 Nanomaterials Str.622 Micro and Nano Structured Materials and Devices Str.623 Metal Additive Manufacturing Str.655 Design for Additive Manufacturing Str.661 Introduction to Polymer Science		·		1		
Stress Waves, Impacts and Shockwaves Structure and Properties of Materials Structure and Properties of Materials Stricture and Biological Properties of Materials Stricture and Biological Properties of Materials Undergraduate chemistry & biology See program Course Offering page for Schedule Stricture Additive Manufacturing Stricture and Properties of Materials Undergraduate chemistry & biology See program Course Offering page for Schedule Schedule Stricture Additive Manufacturing Stricture		· · · · · · · · · · · · · · · · · · ·	<u> </u>		0	_
515.601 Structure and Properties of Materials 515.602 Thermodynamics and Kinetics of Materials 515.606 Chemical and Biological Properties of Materials 515.611 Computational Molecular Dynamics 515.617 Nanomaterials 515.622 Micro and Nano Structured Materials and Devices 515.627 Chemistry of Nanomaterials 515.655 Metal Additive Manufacturing 515.658 Design for Additive Manufacturing 515.661 Introduction to Polymer Science			mecnanics			VL
Thermodynamics and Kinetics of Materials 515.602	515,601	Structure and Properties of Materials		+	<u> </u>	(even years)
515.606 Chemical and Biological Properties of Materials 515.611 Computational Molecular Dynamics 515.617 Nanomaterials 515.622 Micro and Nano Structured Materials and Devices 515.627 Chemistry of Nanomaterials 515.655 Metal Additive Manufacturing 515.658 Design for Additive Manufacturing 515.661 Introduction to Polymer Science 515.661 Science and Computer 515.655 Science and Computer 515.656 Science and Computer 515.657 Chemistry of Nanomaterials 515.658 Design for Additive Manufacturing 515.658 Design for Additive Manufacturing 515.659 Science and Computer 515.650 Science and Computer 515.651 Science and Computer 515.652 Science and Computer 515.653 Science and Computer		·		1		
515.611 Computational Molecular Dynamics 515.617 Nanomaterials 515.622 Micro and Nano Structured Materials and Devices 515.627 Chemistry of Nanomaterials 515.655 Metal Additive Manufacturing 515.658 Design for Additive Manufacturing 515.661 Introduction to Polymer Science		·	Undergraduate chemistry & biology			
515.617 Nanomaterials 515.622 Micro and Nano Structured Materials and Devices 515.627 Chemistry of Nanomaterials 515.655 Metal Additive Manufacturing 515.658 Design for Additive Manufacturing 515.661 Introduction to Polymer Science Schedule 515.XXX - Materials Science and Engineering 515.XXX - Materials Science and Engineering 515.655 525.XXX - Electrical and Computer		•	, 0/	See progran		ering page for
515.622 Micro and Nano Structured Materials and Devices 515.627 Chemistry of Nanomaterials 515.655 Metal Additive Manufacturing 515.658 Design for Additive Manufacturing 515.661 Introduction to Polymer Science 515.661 Significant Science and Engineering 515.855 Significant Science and Engineering 515.855 Significant Science and Engineering 515.855 Significant Science and Engineering		·		1	<u>schedule</u>	
515.627 Chemistry of Nanomaterials 515.655 Metal Additive Manufacturing 515.658 Design for Additive Manufacturing 515.661 Introduction to Polymer Science 515.661 Significant Science and Engineering 515.655 Significant Science and Engineering 515.655 Significant Science and Engineering						
515.655 Metal Additive Manufacturing 515.658 Design for Additive Manufacturing 515.661 Introduction to Polymer Science 515.661 Engineering 515.655 Introduction to Polymer Science				515.XXX		
515.658 Design for Additive Manufacturing 515.655 515.661 Introduction to Polymer Science 525.XXX - Electrical and Computer Engineering		,		1	Engineering	
515.661 Introduction to Polymer Science Engineering		5	515.655	1		
Engineering				525.XXX -		
				1	Engineering	

^{*}See catalog of complete list and description of prerequisites

Mechanical Engineering

Course #	Course Name	Pre-Req*	Summer	Fall	Spring			
565.604	Structural Mechanics		FCE V	(X - Civil Engir	ooring.			
565.680	Marine Geotechnical Engineering		303.87	ieering				
565.682	Design of Ocean Structures							
565.731	Structural Dynamics	535.641	1					
Independ	Independent Study/Thesis Courses							
535.800	Independent Study		0	0	0			
535.820	Master's Graduate Research	Approval form completed and approved	0	0	0			
535.821	Master's Graduate Thesis	by advisor(s) and program chair	0	0	0			

^{*}See catalog for complete description of prerequisites for each course