### Mech and Aero - Joint (MAAJ)

#### Mechanical and Aerospace Engineering (Joint) (MAAJ) Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit</th>
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<tr>
<td>MAAJ 5001</td>
<td>0.5</td>
<td>Theory of Elasticity</td>
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<tr>
<td>MAAJ 5002</td>
<td>0.5</td>
<td>Advanced Stress Analysis</td>
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<td>MAAJ 5003</td>
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<td>Theory Perfectly Plastic Solid</td>
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<td>MAAJ 5004</td>
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<td>Theory of Plates and Shells</td>
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<td>Continuum Mechanics</td>
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<td>MAAJ 5006</td>
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<td>Advanced Topics in Elasticity</td>
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<td>MAAJ 5007</td>
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<td>Adv. Dynamics w/Applications</td>
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<td>MAAJ 5008</td>
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<td>Finite Element Analysis</td>
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<td>MAAJ 5009</td>
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<td>Advanced Topics in Finite Element Analysis</td>
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<td>MAAJ 5010</td>
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<td>Performance and Economics of V/Stol Aircraft</td>
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<td>MAAJ 5011</td>
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<td>Advanced Topics in Advanced Materials and Manufacturing</td>
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<td>MAAJ 5012</td>
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<td>Computational Metallurgy</td>
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<td>MAAJ 5014</td>
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<td>Ground Transportation Systems and Vehicles</td>
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<td>MAAJ 5021</td>
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<td>Methods of Energy Conversion</td>
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<td>MAAJ 5022</td>
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<td>MAAJ 5025</td>
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<td>Wind Engineering</td>
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<td>MAAJ 5026</td>
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<td>System Modelling, Dynamics and Control</td>
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<td>MAAJ 5027</td>
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<td>Nonlinear System Analysis and Controls</td>
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<td>MAAJ 5028</td>
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<td>3D Machine Vision: From Robots to the Space Station</td>
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<td>Aero-Acoustics</td>
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<td>Gas Turbines</td>
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<td>Convective Heat and Mass Transfers</td>
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<td>MAAJ 5050</td>
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<td>Fundamentals of Fluid Dynamics</td>
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<td>MAAJ 5051</td>
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<td>Deformation and Fracture of Engineering Materials</td>
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<td>MAAJ 5052</td>
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<td>Failure Analysis of High-Temperature Protective Coatings for Aerospace Applications</td>
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<td>MAAJ 5053</td>
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<td>Fatigue and Damage Tolerance in Aircraft</td>
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<td>MAAJ 5054</td>
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<td>Finite-Volume Methods for Compressible Flows</td>
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<td>MAAJ 5055</td>
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<td>High-Performance Parallel Scientific Computing</td>
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<td>Materials Characterization Techniques</td>
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<td>Materials Selection in Engineering Design</td>
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<td>MAAJ 5058</td>
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<td>Non-Equilibrium Gas Dynamics</td>
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<td>MAAJ 5100</td>
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<td>Micromechanics of Solids</td>
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<td>Experimental Stress Analysis</td>
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<td>MAAJ 5103</td>
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<td>Integrated Manufacturing - CIMS</td>
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MAAJ 5105 [0.5 credit] (MCG 5115)  
Non-Linear Optimization

MAAJ 5107 [0.5 credit] (AMM 5117)  
Intro to Composite Materials  
Includes: Experiential Learning Activity

MAAJ 5108 [0.5 credit] (AMM 5118)  
Introduction to Plasticity

MAAJ 5109 [0.5 credit] (AMM 5119)  
Fracture Mechanics

MAAJ 5122 [0.5 credit] (MCG 5352)  
Optimal Control Systems

MAAJ 5123 [0.5 credit] (MCG 5353)  
Robotics

MAAJ 5151 [0.5 credit] (MCG 5311)  
Dynamics and Aerodynamics of Flight  
Includes: Experiential Learning Activity  
Also listed as MECH 5101.

MAAJ 5152 [0.5 credit] (MCG 5301)  
Theory of Viscous Flows

MAAJ 5153 [0.5 credit] (MCG 5303)  
Incompressible Non-Viscous Flows

MAAJ 5154 [0.5 credit] (MCG 5304)  
Compressible Non-Viscous Flows

MAAJ 5155 [0.5 credit] (MCG 5315)  
Orbital Mechanics and Space Control  
Includes: Experiential Learning Activity  
Also listed as MECH 5105.

MAAJ 5156 [0.5 credit] (AMM 5381)  
Lightweight Structures

MAAJ 5157 [0.5 credit] (MCG 5121)  
Space Mission Analysis and Design

MAAJ 5158 [0.5 credit] (MCG 5308)  
Experimental Methods in Fluid Mechanics

MAAJ 5159 [0.5 credit] (MCG 5122)  
Smart Structures

MAAJ 5206 [0.5 credit] (AMM 5126)  
Deformation of Materials

MAAJ 5209 [0.5 credit] (AMM 5129)  
Hot Working of Metals

MAAJ 5251 [0.5 credit] (MCG 5354)  
Guidance, Navigation and Control

MAAJ 5252 [0.5 credit] (MCG 5356)  
Neuro and Fuzzy Control

MAAJ 5253 [0.5 credit] (MCG 5366)  
Finite Element Analysis II

MAAJ 5254 [0.5 credit] (MCG 5483)  
Fundamentals of Combustion  
Also listed as MECH 5204.

MAAJ 5255 [0.5 credit] (MCG 5324)  
Building Performance Simulation  
Includes: Experiential Learning Activity  
Also listed as MECH 5205.

MAAJ 5301 [0.5 credit] (MCG 5131)  
Heat Transfer by Conduction

MAAJ 5302 [0.5 credit] (MCG 5132)  
Heat Transfer by Convection

MAAJ 5303 [0.5 credit] (MCG 5133)  
Heat Transfer by Radiation

MAAJ 5304 [0.5 credit] (MCG 5134)  
Heat Transfer w/Phase Change

MAAJ 5305 [0.5 credit] (MCG 5343)  
Advanced Thermodynamics

MAAJ 5306 [0.5 credit] (MCG 5136)  
Special Studies in Fluid Mech and Heat Transfer

MAAJ 5307 [0.5 credit] (AMM 5137)  
Special Studies in Solid Mechanics and Materials

MAAJ 5308 [0.5 credit] (MCG 5138)  
Advanced Topics in Mechanical Engineering

MAAJ 5309 [0.5 credit] (MCG 5375)  
CAD/CAM

MAAJ 5311 [0.5 credit] (MCG 5471)  
Special Topics in Mechanical and Aerospace Engineering

MAAJ 5312 [0.5 credit] (MCG 5472)  
Special Topics in Mechanical and Aerospace Engineering

MAAJ 5313 [0.5 credit] (MCG 5473)  
Special Topics in Mechanical and Aerospace Engineering

MAAJ 5314 [0.5 credit] (MCG 5474)  
Special Topics in Mechanical and Aerospace Engineering

MAAJ 5315 [0.5 credit] (MCG 5475)  
Special Topics in Mechanical and Aerospace Engineering

MAAJ 5316 [0.5 credit] (MCG 5476)  
Special Topics in Mechanical and Aerospace Engineering

MAAJ 5317 [0.5 credit] (MCG 5477)  
Special Topics in Mechanical and Aerospace Engineering
MAAJ 5318 [0.5 credit] (MCG 5478)
Special Topics in Mechanical and Aerospace Engineering

MAAJ 5319 [0.5 credit] (MCG 5479)
Special Topics in Mechanical and Aerospace Engineering

MAAJ 5340 [0.5 credit] (MCG 5344)
Gas Turbine Combustion

MAAJ 5352 [0.5 credit] (MCG 5332)
Instrumentation Techniques
Also listed as MECH 5302.

MAAJ 5354 [0.5 credit] (MCG 5334)
Computational Fluid Dynamics of Compressible Flow
Also listed as MECH 5304.

MAAJ 5356 [0.5 credit] (MCG 5306)
Theory of Subsonic Flows

MAAJ 5357 [0.5 credit] (MCG 5307)
Theory of Supersonic Flows

MAAJ 5401 [0.5 credit] (MCG 5141)
Statistical Thermodynamics

MAAJ 5402 [0.5 credit] (MCG 5370)
Special Topics in Mechanical and Aeronautical Engineering

MAAJ 5403 [0.5 credit] (MCG 5470)
Special Topics in Mechanical and Aerospace Engineering

MAAJ 5408 [0.5 credit] (MCG 5551)
Theorie d’Ecoulement Visqueux

MAAJ 5409 [0.5 credit] (MCG 5552)
Theorie de Turbulence

MAAJ 5451 [0.5 credit] (MCG 5341)
Turbomachinery
Includes: Experiential Learning Activity
Also listed as MECH 5401.

MAAJ 5452 [0.5 credit] (AMM 5144)
Superalloys and Ceramix-Metal Matrix Composites

MAAJ 5457 [0.5 credit] (MCG 5347)
Conductive and Radiative Heat Transfer
Also listed as MECH 5407.

MAAJ 5459 [0.5 credit] (MCG 5349)
Two-Phase Flow and Heat Transfer

MAAJ 5500 [0.5 credit] (MCG 5557)
Méthodes numériques en mécanique

MAAJ 5501 [0.5 credit] (MCG 5151)
Laminar Flow Theory

MAAJ 5502 [0.5 credit] (MCG 5152)
Theory of Turbulence

MAAJ 5505 [0.5 credit] (MCG 5155)
Inviscid Flow Theory

MAAJ 5506 [0.5 credit] (MCG 5156)
Measurement of Fluid Mech

MAAJ 5507 [0.5 credit] (MCG 5157)
Num Comp: Fluid Dyn and Heat Tran

MAAJ 5509 [0.5 credit] (AMM 5159)
Advanced Production Planning and Control

MAAJ 5550 [0.5 credit] (MCG 5350)
Advanced Vibration Analysis
Includes: Experiential Learning Activity
Also listed as MECH 5500.

MAAJ 5555 [0.5 credit] (MCG 5355)
Stability Theory & Application
Also listed as MECH 5505.

MAAJ 5557 [0.5 credit] (MCG 5124)
Advanced Kinematics
Includes: Experiential Learning Activity
Also listed as MECH 5507.

MAAJ 5607 [0.5 credit] (MCG 5167)
Nuclear Reactor Engineering

MAAJ 5608 [0.5 credit] (AMM 5168)
Industrial Organization

MAAJ 5609 [0.5 credit] (MCG 5169)
Advanced Topics in Reliability Engineer

MAAJ 5652 [0.5 credit] (AMM 5362)
Failure Prevention

MAAJ 5655 [0.5 credit] (MCG 5365)
Finite Element Analysis I
Also listed as MECH 5605.

MAAJ 5656 [0.5 credit] (MCG 5367)
The Boundary Element Method
Includes: Experiential Learning Activity
Also listed as MECH 5607.

MAAJ 5657 [0.5 credit] (MCG 5361)
Creative Problem Solving and Design
Also listed as MECH 5601.

MAAJ 5659 [0.5 credit] (AMM 5123)
Microstructure and Properties of Materials
Also listed as MECH 5609.

MAAJ 5700 [0.5 credit] (MCG 5170)
Computer-Aided Design
Includes: Experiential Learning Activity

MAAJ 5701 [0.5 credit] (MCG 5171)
Applied Reliability Theory
MAAJ 5703 [0.5 credit] (MCG 5173)  
Systems Engineer and Integration

MAAJ 5707 [0.5 credit] (MCG 5177)  
Robot Mechanics

MAAJ 5709 [0.5 credit] (AMM 5179)  
Manufacturing System Analysis

MAAJ 5750 [0.5 credit] (AMM 5345)  
Surfaces and Coatings
Also listed as MECH 5700.

MAAJ 5751 [0.5 credit] (AMM 5369)  
Metallic Phases and Transformations
Precludes additional credit for MECH 5701.

MAAJ 5802 [0.5 credit] (AMM 5182)  
Theory of Elastic Instability

MAAJ 5804 [0.5 credit] (MCG 5184)  
Mechatronics

MAAJ 5805 [0.5 credit] (MCG 5185)  
Multivariable Digital Control

MAAJ 5806 [0.5 credit] (MCG 5186)  
Non-Linear Disc Dyn and Control

MAAJ 5850 [0.5 credit] (MCG 5480)  
Special Topics in Mechanical and Aerospace Engineering
Also listed as MECH 5800.

MAAJ 5851 [0.5 credit] (MCG 5380)  
Safety and Risk Assessment of Nuclear Power

MAAJ 5852 [0.5 credit] (MCG 5483)  
Special Topics in Mechanical and Aerospace Engineering
Also listed as MECH 5802.

MAAJ 5853 [0.5 credit] (MCG 5488)  
Special Topics in Mechanical and Aerospace Engineering
Also listed as MECH 5803.

MAAJ 5854 [0.5 credit] (MCG 5384)  
Special Topics in Mechanical and Aerospace Engineering
Also listed as MECH 5804.

MAAJ 5855 [0.5 credit] (MCG 5482)  
Special Topics in Mechanical and Aerospace Engineering
Also listed as MECH 5805.

MAAJ 5857 [0.5 credit] (MCG 5487)  
Special Topics in Mechanical and Aerospace Engineering
Also listed as MECH 5807.