

**Appendix A:** List of Regularly Offered Classes in Different Research Areas

**Bioengineering:**

MAE 514 Evaluation of Biomedical Materials  
 MAE 578 Cardiovascular Biomechanics  
 MAE 584 Principles and Materials for MEMS and BioMEMS  
 MAE 607 Biomaterials Science of Cell-Surface Phenomena (cross listed as BMA 501)  
 MAE 608 Polymeric Biomaterials (cross listed as BMA 513)

**Computational and Applied Mechanics:**

Fall	Spring
MAE 529: Finite Element Structural Analysis MAE 582: Introduction to Composite Materials MAE 510: SP TP: Essentials of Probability and Applications MAE 609: High Performance Computing 1	MAE 610: High Performance Computing 2

**Design and Optimization:**

Fall	Spring
MAE 550: Optimization in Engineering Design MAE 564: Manufacturing Automation MAE 510: SP TP: Wind Turbine Modeling MAE 510: SP TP: Decision based System Design MAE 600: SP TP: Shape Synergy and Machine Learning*	MAE 551: Advanced Design Theory MAE 574: Virtual Reality Applications MAE 577: CAD Applications MAE 510: SP TP: Sustainable Manufacturing MAE 510: SP TP: Intelligent CAD Interface*

**Dynamics, Control and Mechatronics:**

Fall	Spring
MAE 536: Random Vibrations and Stochastic Structures* MAE 537: Modal Analysis* MAE 543: Continuous Control Systems MAE 554: Road Vehicle Dynamics 1 MAE 571: System Analysis MAE 593: Math Methods in Robotics MAE 672: Optimal Control Systems* MAE 673: Vibration Control of Structures* MAE 674: Optimal Estimation Methods MAE 600: SP TP: Celestial Mechanics* MAE 600: SP TP: Data Assimilation* MAE 700: SP TP: Adaptive Control <sup>1*</sup>	MAE 525: Spacecraft Dynamics and Control MAE 562: Analytical Dynamics MAE 510: SP TP: Introduction to Probability for Engineers MAE 513: Mobility and Manipulation MAE 566: System Identification* MAE 567: Vibration and Shock MAE 670: Nonlinear Control* MAE 671: Nonlinear Systems* MAE 680: Stochastic Filtering and Control Theory MAE 700: SP TP: Dynamic Programming*

<sup>1</sup> \* Courses offered every other year depending upon the demand

**Fluid and Thermal Sciences:**

Fall	Spring	Summer
MAE 515: Fluid Mechanics 1 MAE 534: Combustion 1 MAE 539: Heating, Ventilation and Air-Conditioning MAE 542: Engineering Applications of Computational Fluid Mechanics MAE 545: Heat Transfer 1 MAE 570: Thermodynamics of Materials	MAE 510: SP TP: Moving Interfaces MAE 510: SP TP: Physical Fluid Dynamics MAE 516: Fluid Mechanics 2 MAE 519: Turbulent Flow MAE 540: Computational Fluid Mechanics MAE 546: Heat Transfer 2 MAE 703: Introduction to Combustion Diagnosis	MAE 509: Direct Energy Conversion

**Materials:**

MAE 502 Kinetics  
MAE 538 Smart Materials  
MAE 570 Thermodynamics of Engineering Materials  
MAE 581 Advanced Materials Science  
MAE 587 Modern Theory of Materials  
MAE 589 Diffraction, Microscopy and Spectroscopy Techniques

In addition to the aforementioned classes, students are encouraged to take following two math classes, which are useful irrespective of their choice of focus research area:

MAE 507: Engineering Analysis 1  
MAE 508: Engineering Analysis 2