USC Viterbi School of Engineering

Aerospace and Mechanical Engineering:
Ph.D. Dissertation Topics

2016 Dissertation Titles

- On the Dynamic Fracture Behavior of Polymeric Materials Subjected to Extreme Conditions
- A Quantitative Framework of Modeling Ciliary Transport in Health and Disease
- Perturbing Combustion Kinetics with Non-thermal Plasma
- Stability versus Maneuverability in Hovering Flight
- Behavioral Modeling and Computational Synthesis of Self-Organizing Systems
- Studies of High-pressure Flame Phenomena using Numerical Simulations
- Shock Wave Response of Iron-based In-situ Metallic Glass Matrix Composites
- Studies of Subatmospheric Combustion Characteristics of Jet Fuels
- Nonlinear Control of Flexible Rotating Systems with Varying Velocity
- Modeling, Analysis and Experimental Validation of Flexible Rotor-bearing Systems with Water-lubricated Rubber Bearings
- X-ray Microbeam Diffraction Measurements of Long Range Internal Stresses in Equal Channel Angular Pressed Aluminum
- Transport Mechanisms for Ocular Drug Delivery and Therapies
- Properties of a ZK60 Magnesium Alloy Processed by Severe Plastic Deformation
- Transitions in Collective Behavior of Microswimmers Confined in Microgeometries
- Studies of Combustion Characteristics of Heavy Hydrocarbons in Simple and Complex Flows

2015 Dissertation Titles

- Investigating Coarse Large Eddy Simulation and Subgrid-scale Modeling for a Laminar Separation Bubble
- Numerical Modeling of Separated Flows at Moderate Reynolds Numbers Appropriate for Turbine Blades and Unmanned Aero Vehicles
- Latent Heat Thermal Energy Storage to Augment Solar Thermal Propulsion
- Evaluation and Development of Temporal and Spatial High-order Methods in Computational Fluid Dynamics
- Perturbation Analysis of Flow about Spherically Pulsating Bubble in a Standing Wave
- Combustion Properties of C1-C4 Alcohols at Reduced Pressures
- Ageing and Mechanical Failure of Fiber Reinforced Polymers
- An Ontology and Methodology for the Design of Self-organizing Systems
- Oscillatory and Streaming Flow Due to Small-amplitude Vibrations in Spherical Geometry
- An Analytical Dynamics Approach to the Control of Mechanical Systems
- Synchrotron X-ray Diffraction Measurements of Long Range Internal Stresses of Deformed Metals
- Structure and Behavior of Nano Metallic Multilayers under Thermal and Mechanical Loading
- Ocular Drug Delivery and Transport Mechanism

- Scattering of SH-wave and Dynamic Stress Concentration for Multiple Multilayered Inclusions

2014 Dissertation Titles

- Mathematical Formulation for Deployment Dynamics of Shape Memory Polymer Composite Space Structure
- Modeling and Simulation of Circulating Tumor Cells in Flow
- Flow Around a Sphere Moving in a Steady Horizontal Motion Through a Linearly Stratified Fluid
- Boundary Layer and Separation Control on Wings at Low Reynolds Numbers
- Modeling Wheelchair Users Undergoing Vibrations
- Quaternion Dynamics
- Synthesis and Mechanical Behavior of Highly Nanotwinned Metals
- Dynamic Structuring in CSO Systems
- Characterization of Flame Generated Soot Morphology and Its Impact on Soot Growth Processes and Surface Chemistry
- Collaborative Stimulation in Team Design Thinking