**AE 7792: Advanced Mechanics of Composites**

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| Credit Hours: | 3-0-3 |
| Prerequisites: | AE 4791 or CEE 4791 or CHE 4791 or TFE 4791 or ME 4791 or MSE 4791 or equivalent |
| Catalog Description: | Anisotropic elasticity, hygrothermal behavior, stress analysis of laminated composites including 3D effects, stress concentrations, free-edge effects, thick laminates, adhesive and mechanical connections, fracture of composites. Crosslisted with ME, CHE, CEE, MSE, and TFE 7792. |
| Textbooks: | None; Instructor's notes. |
| Topics: | * Review of anisotropic elasticity. * Failure theories. * Hygrothermal behavior and related constitutive equations; fabrication or residual stresses. * Stress analysis in laminated composites including 3-D effects; variational formulation. * Thick laminates: transverse shear deformation, first order and higher order theories. * Local effects associated with geometric and material discontinuities: free edge, ply termination, interface, etc. * Joints: mechanical and adhesive connections. * Creep of composites: Stress-strain relations including time and temperature factors; material property deterioration. * Fracture of composites: crack formation; mode of fracture; separation of modes; energy release rate, analytic determination and experimental measurement. * Impact: stresses and damages in a laminate due to low velocity impact. * Hybrid composites and other advanced topics. |