(Tentative) List of Problem Sets for A&AE 519
Hypersonic Aerothermodynamics
Prof. Steve Schneider Fall 2013

The problem sets won't change much from past years. However, the exams will be new. Please note that several problem sets involve the use of FORTRAN code; this language remains in common use in the industry, and it would in any case be a lot of work to translate this code into another language. If you are unfamiliar with FORTRAN this is an opportunity to learn something about it.

1. Diamond airfoil with exact and hypersonic approximations (1.5 weeks)

2. Cone frustum with Newtonian approximation (2 weeks)

3. Taylor-Maccoll solution for cone, study plus numerics (1 week) (midterm 1, inviscid flow, ca. early October, 1 week allotted)

4. Run Euler code (BLUNT, FORTRAN) for sphere-cone, cp. to expt. (1.5 weeks)

5. Falkner-Skan similarity solution for low-speed boundary layer (1 week)

6. Compressible flat-plate similarity solution, adapt and run FORTRAN code (2 weeks) (midterm 2, viscous and heating issues, ca. mid-November, 1 week allotted)

7. Normal shock properties for perfect-gas and equilibrium air (2 weeks). FORTRAN code sections handed out.