AOE 4134 ASTROMECANICS

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Text: Bate Mueller & White; Fundamentals of Astrodynamics, Dover Publications Inc. 1971

Grading: Two Tests 2.5 (42%)  
Homework, etc 1.5 (25%)  
Final 2 (33%)  
Total 6 (100%)

Ground Rules : Students are encouraged to discuss homework together. However, the final effort MUST BE YOUR OWN. Assignments will be given on a quasi-weekly basis. The Honor code applies to all work.

Outline

1. Preliminaries
2. Two Body Problem  
equations of motion  
differential equation of the orbit  
equation of the orbit  
orbital properties  
orbit in space - orbital elements
3. Orbit determination  
coordinate transformations  
two line element sets
4. Orbital Maneuvers  
transfer  
plane changes
5. Time Equations
6. Mission analysis  
flyby and capture  
patched conic approximations
7. Selected Problems (typically) - Lambert’s problem, low thrust maneuvers, intercept & rendezvous - other suggestions?
REFERENCES

   Has lots of additional information and algorithms

   First Chapter applies to this course - Excellent book

   Has additional material regarding launch vehicles and satellites

   A “by the numbers” book, lacks rigor

   This book is ok for an AIAA book - lots of topics, probably better as a second book

   Excellent book

   Has additional information about satellite attitude control

   Fairly concise

9. Roy, Orbital Motion, Adam Hilger Ltd., 1978

    Graduate level

    This is a “classic” but difficult to read at first.