ASTE 561
Human Factors of Spacecraft Operations
Fall 2019

Fridays, 3:00-5:40 pm, on-campus and DEN

Course Description

This course provides a fundamental understanding of the human factors specific to space flight that must be taken into consideration in the design of spacecraft which incorporate human-in-the-loop control. Students will be taught how to design human factors experiments utilizing task analysis and user testing with quantitative evaluation metrics to develop a safe and high-performing operational space system.

Students will be responsible for creating a human factors test report to document the results of a semester-long experiment.

Topics

- Human needs, capabilities, and limitations
- Task analysis and functional allocation
- Design of human factors experiments
- Situation awareness
- Workload and Usability
- Space vehicle displays and controls
- Piloted spacecraft handling qualities
- Human error analysis and prevention
- Anthropometrics
- Human supervisory control of automated systems

Prerequisites

- None

Required reading materials

- Lecture notes and publically available reading materials will be provided throughout the course.

Supplementary reading materials

- *Human Factors in Simple and Complex Systems*,(2nd. Ed.) Proctor, R.W. and Van Zandt, T., CRC Press, 2008. (ISBN: 9780805841190)
- *An Introduction to Human Factors Engineering* (2nd Ed.) Wickens, C.D., Lee, J.D., Liu, Y. and Becker, S.E.G., Pearson Prentice Hall, 2004. (ISBN: 0-13-183736-2)
- NASA Human Integration Design Processes document, September 2014t:
    - https://www.nasa.gov/sites/default/files/atoms/files/human_integration_design_processes.pdf
- NASA Human Integration Design Handbook, Rev 1, June 5, 2014
    - https://www.nasa.gov/sites/default/files/atoms/files/human_integration_design_handbook_revision_1.pdf

Instructor

- Prof. Garrett Reisman, ASTE – gereisma@usc.edu   USC Faculty Directory Page