rev 24AUG2021

ASEN 5158
SPACE HABITAT DESIGN

Fall 2021
Tuesday/Thursday 1005-1120
Room Aero N240

Lecture recordings available on Canvas after class

Instructor: Prof. David Klaus
telephone: (303) 492-3525
email: klaus@colorado.edu

TA: Hunter Hatchell
email:Hunter.Hatchell@colorado.edu

with

functional knowledge of the technologies used to sustain life. Emphasis

To be set…

Textbook –either eBook or Print, your choice, this is a nice reference book with lots of useful design info

Human Spaceflight Mission Analysis and Design, Larson, McQuade and Pranke (2nd ed.), 2014/15
https://spacetechnologyseries.com/books/Human-Spaceflight.html

Topics (*contents and sequence subject to minor revision during the semester*)

Introduction to Human Spaceflight
Human Space Mission Objectives and Design Process
Space Environments – Orbit, Planets and NEO's
Human Physiology ~*alive and healthy*
Ergonomics, Human Factors and Psychology ~*happy and productive*

Systems Engineering Terminology, Definitions, Acronyms and Design Phases

Exam 1 ~*Requirement Drivers*

Design Reference Mission (DRM) / Concept of Operations (ConOps)
Functional Decomposition Process
Requirements, Constraints and Ground Rules & Assumptions (GR&A)
Operational Concept (OpsCon)

Fundamentals of Orbits and Entry / Descent/ Landing / Ascent (EDLA) ~*getting there and back*

Defining and Sizing Spacecraft Elements (orbital and surface habitats) ~*support needs of the crew*
Human-Rating Process, 'Human in the Loop' Design Drivers ~*Accommodate, Utilize and Protect*
Determining Habitable Volume

Environmental Control & Life Support System (ECLSS) Functions & Enabling Technologies
Atmosphere Management