Estimating Parameters for ENAE 791 Final Project (2020)

As per NASA JSC-26098, the mass estimating relation for a fully equipped human habitat is

$$m[kg] = 460(V[m^3])^{0.76}$$

The required volume for a human spacecraft (from Cohen, SAE 2008-01-2027) can be estimated by

$$V[m^3] = 1.74C(D[days])^{0.7444}$$

where C is the crew size and D is the mission duration. (Note: since those doing the LEO tourist project are trying to give the paying customers a memorable experience, I would suggest that 10 m^3/person is a minimum volume allocation regardless of how short the mission duration is.)