This paper considers the redundancy allocation problem (RAP) in which both the type of components and the corresponding number of redundancy of each component in each subsystem are to be decided simultaneously so as to minimize the system cost subject to reliability constraint. The problem has been studied in the literature for decades, usually using mathematical programming or heuristic/metaheuristic optimization approaches where they consider only the homogeneous redundancy. A metaheuristic approach based on the ant colony system combined with the universal moment generating function is presented for solving both the ordinary and the heterogeneous RAP. It can efficiently search to find the feasible optimal or near optimal solution. The obtained computational results using the approach, demonstrate that this one is a promising tool for solving this class of redundancy allocation problem especially at the design stage