Abstract
 The paper deals with minimization of the weighted average of compliances of structures, made of an elastic material of spatially varying elasticity moduli, subjected to n load variants acting non-simultaneously. The trace of the Hooke tensor is assumed as the unit cost of the design. Three versions of the free material design are discussed: designing the moduli of arbitrary anisotropy (AMD), designing the moduli of an isotropic material (IMD), designing of Young's modulus for a fixed Poisson ratio (YMD). The problem is in all cases reduced to the Linear Constrained Problem (LCP) of Bouchitté and Fragalà consisting of two mutually dual problems: stress based and strain based, the former one being characterized by the integrand of linear growth depending on the trial statically admissible stresses. The paper shows equivalence of the stress fields solving the (LCP) problem and those appearing in the optimal body subjected to subsequent load cases.