thermal stress in linear and non hamogeneous elastic plates

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SUlJLLlBYThe present thesis consists of three chapters IThe first chapter contains the basic conceptsand definitions from the theory of thermoelasticityin two dimensions and the plane problem of the thermoelusticbodies the properties of which are temperature-dependent.The second chapter contains the formulationand tho solution of the problem in elastic plate withll:Iciroular hole having temperature independent modulusof elasticity under the effect of steady stauheatflow and submitted to a uniform tension (pressure) of ,magnitude (P). The solution of the problem is givenin (1.2) represented as a sur~of. solution of two problema,t~e first is the thermal problem assuming P • 0and the second is the problem of deformation of the,(Iplate under the pressure without 'temperature and thestresses distribution are found in this case.The third ohapter contains the solution o~ -thenonhomOue~o~ problem when modulus o~ elastioity istemperature dependent.The solution is obtained by the method o~ suooessiveapproximation.The fourth chapter contains • numerioal examplewhich is computed for :.The stresses distribution in this 0888 are found andthe relations between the stresses and radius i8 obtain• the relations between the maximum value o~ oircum~erential stress and the temlle.ratureand that otpressure are obtained and the stress distribution onthe oircumference of the hole is found.The effect of the temperature-dependent modulus IIIof elastioity is to decrease the maximum value ot thecircumferential stresse. and by oompar1Qg with the•case of temperature-independent modulus ot elastioity.~~r example the decreasing reaches to :O.J~