

Disciplina: Tópicos Especiais - Introdução à Teoria de Homogeneização - ITH (aprovada no Colegiado em 10/11/2023) - CH:2

Ementa:

Conceitos fundamentais e equações básicas da mecânica dos meios contínuos (MMC).

Fundamentos da mecânica dos compósitos.

Modelos básicos em mecânica de compósitos.

Determinação do limite para módulos elásticos efetivos: princípios clássicos de extremos.

Determinação de módulos efetivos utilizando métodos da micromecânica.

Introdução ao método de homogeneização assintótica em duas escalas (AHM).

Bibliografia:

- [1]. Bertram, A. Elasticity and plasticity of large deformations. Springer Verlag Berlin, (2000).
- [2]. Yavuz Baçar, Dieter Weichert, Nonlinear continuum mechanics of solids. Springer Verlag Berlin, (2005).
- [3]. Sokolnikoff, I.S. Tensor analysis, theory and applications to geometry and mechanics of continua. Wiley, New York, (1964).
- [4]. Sokolnikoff, I.S. Mathematical theory of elasticity. McGraw-Hill, New York, pgs. 476, (1956).
- [5]. Margarita E. Eglit y Dewey H. Hodges, Continuum mechanics via problems and exercises. Part I: Theory and problems. Part II: Answers and solutions. World Scientific Series on Nonlinear Science, Series Editor: Leon O. Chua. Series A, Vol. 19, (1996).
- [6]. Spencer, A.J.M. Continuum mechanics, Longman, London, New York, (1980).
- [7]. Frank M. White. Fluid Mechanics. McGraw-Hill, (1999).
- [8]. Robert William Soutas-Little. Elasticity. Dover, New York, (1999).
- [9]. Martin H. Sadd. Elasticity: Theory, Applications and Numerics. Elsevier (2005).
- [10]. Jacob Aboudi Mechanics of composite materials: A unified micromechanical approach. Elsevier. (1991).
- [11]. Jianmin Qu, Mohammed Cherkaoui. Fundamentals of Micromechanics of Solids, John Wiley & Sons, New Jersey. (2006).
- [12] Hashin, Z. (1974) Theory of fiber reinforced materials, NASA Contractor Report. NASA CR-(1974).
- [13]. Jones, R.M. Mechanics of composite materials, 2nd ed, Blacksburg, Virginia, (1999).
- [14]. Levy Neto, F., Pardini, L. C. Compósitos estruturais: ciência e tecnologia, São Paulo: E. Blucher, (2016).
- [15]. Eshelby, J. D. The elastic field of an ellipsoidal inclusion, and related problems. Proceedings of the Royal Society A241, 376-396, (1957).
- [16]. Mori, T.; Tanaka., K. Acta Metall. 21, 571-574, (1973).
- [17]. Budiansky, B. On the elastic moduli of some heterogeneous materials. Journal of the Mechanics and Physics of Solids. 13, 223-227, (1965).
- [18]. Hill, R. A self-consistent mechanics of composite materials. Journal of the Mechanics and Physics of Solids. 13, 213-222, (1965).
- [19]. Voigt, W. Über die Beziehung zwischen den beiden Elastizitätskonstanten isotroper Körper. Wied. Ann. 38, 573-587, (1889).