Material and Computational Mechanics

2 units (selection)

Atsuya Oishi · Associate Professor / Mechanical Science, Mechanical Engineering, Intelligent Structures and Mechanics Systems Engineering
Takuo Nagamachi · Associate Professor / Mechanical Systems, Mechanical Engineering, Intelligent Structures and Mechanics Systems Engineering

Target〉 To understand both theory and computing system for computational mechanics of solving physical phinomina for natural and artificial objects

Outline〉 From theoretical aspects deformation theory of solids, FEM and numerical methods are discussed. From aspects of computing system, algorism and high performace procedure are given of large scale computing system for designs and working of material, machine and structures, and controls.

Style〉 Lecture

Keyword〉 ***nonlinear probloem of solid mechanics, large scale system of computational mechanics***

Fundamental Lecture〉 "**Solid Mechanics**"(1.0)

Relational Lecture〉 "**Advanced Exercise on Mechanical Engineering**"(0.5), "**Advanced Production Technology**"(0.5)

Goal〉

1. To understand mathematical theory and physics for nonlinear problems for solid
2. To construct large scale computing system and to simulate using them and understand of their results.

Schedule〉

1. Tensor analysis
2. Weighted residual mathod and variational principles
3. Non-linear mataerial problems
4. Geomytrically non-linear problems
5. Time depending problems
6. Application to non-structual problems
7. Envirament for parallel processing
8. Algorism for parallel processing FEM analysis
9. Implementation of parallel processing FEM analysis
10. Basic theory of soft computing
11. Soft omputing for CAE
12. Implicit method for statics
13. Explicit method for dynamics
14. Constitutive equations for non-iron-metals
15. Method of high speed computing
16. Recent h igh pricision method of FEM simulations

Evaluation Criteria〉 Assignments count 100%

Textbook〉 矢川・吉村著，有限要素法，培風館

Reference〉 O．C．ツイエンキーヴィッツ，マトリックス有限要素法，培風館

Contents〉 http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216666

Student〉 Able to be taken by only specified class(es)

Contact〉

⇒ Oishi (M622, +81-88-656-7365, oishi@me.tokushima-u.ac.jp) Mail
⇒ Nagamachi (M524, ngmch@me.tokushima-u.ac.jp) Mail (Office Hour: 毎週水曜日 17 時 ~ 18 時)