

電気通信大学 平成20年度シラバス

授業科目名	Introduction to computational methods in science and engineering using MATLAB		
英文授業科目名	Introduction to computational methods in science and engineering		
開講年度	2008年度	開講年次	3、4年次
開講学期	前学期	開講コース・課程	昼間コース
授業の方法	講義	単位数	2
科目区分	総合文化科目-国際科目-		
開講学科・専攻	情報通信工学科 情報工学科 電子工学科 量子・物質工学科 知能機械工学科 システム工学科 人間コミュニケーション学科		
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【主題および達成目標】
<p>Computational methods have replaced analytical methods already in many fields of science and engineering, and their importance is still increasing. The aim of the lecture is to provide fundamental criteria for the choice of numerical methods, give an overview about some available methods in some fields, and give ideas about performance-oriented implementation for such methods. Depending on the background and interest of the auditory, some subjects can be changed.</p>

【前もって履修しておくべき科目】
A reasonable command of the English Language.

【前もって履修しておくことが望ましい科目】
The knowledge of one procedural Programming Language is necessary (C, Fortran, Pascal etc.), and the knowledge of basic higher Mathematics is also necessary (Linear Algebra, Calculus)

【教科書等】
The material and further references are uploaded in the E-Learning system.

【授業内容とその進め方】

1. Simple MATLAB-Syntax
2. How to write better programs
3. Non-numerical methods: Monte-Carlo techniques
4. Representation of Numbers
5. Elementary numerical analysis: What are numerical errors, and how to get "correct" results from calculations "with error"
6. Graphics
7. Introduction to numerical Linear algebra and how to draw a line through more than 2 points (or maybe not)
8. Polynomials and Roots
9. Solving ordinary differential equations
10. Performance analysis: Which algorithm take long, which are fast, and when does it matter
11. Programming Paradigms: From spaghetti-code to object-orientation, and what does one really need in science and engineering

【成績評価方法及び評価基準(最低達成基準を含む)】

Weekly exercises in the E-Learning System of the Class

【オフィスアワー：授業相談】

Students can come whenever I am present in the office.

【学生へのメッセージ】

If you want to improve your scientific English, you are heartily invited to join.

【その他】

Lectures are in English.