



Satuan Acara Pengajaran

MMS8210851 - Metode Penelitian & Komputasi

Pengajar

Nofrijon Bin Imam Sofyan Ph.D

Prof. Dr. Ir. Akhmad Herman Yuwono M.Phil.Eng.

Tujuan Perkuliahan

Mata kuliah ini ditujukan agar mahasiswa mampu (1) menyusun rancangan penelitian, proposal penelitian, penulisan tesis dan publikasi ilmiah menurut aturan ilmiah; dan (2) memahami dan menganalisis metoda komputasi terhadap masalah-masalah proses dan desain di bidang metalurgi dan material serta aplikasinya.

Minggu 1

Materi	General introduction - Class information - Course content and grading - General introduction to experimental research and methodology + Experimental research + Definitions and importance of definitions + Aspect of quantifications + The purpose and principles
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- Referensi**
1. C. R. Kothari: Research Methodology, Methods & Techniques, New Age International (P) Ltd., Publishers, New Delhi, 2004.
 2. G. Marczyk, D. DeMatteo, and D. Festinger: Essentials of Research Design and Methodology, John Wiley & Sons, Inc., Hoboken, New Jersey, 2005.
 3. J. M. Ruane: Essentials of research methods: a guide to social science research, Blackwell Publishing, Malden, 2005.
 4. L. Blaxter, C. Hughes, and M. Tight: How to Research, 3rd ed., Open University Press, Berkshire, UK, 2006.
 5. Y. K. Singh: Fundamental of Research Methodology and Statistics, New Age International (P) Ltd., Publishers, New Delhi, 2006.
 6. S.C. Chapra: Applied Numerical Methods With MATLAB for Engineers and Scientists, McGraw-Hill, Co., Boston, 2005.
 7. W.Y. Yang, W. Cao, T.S. Chung, J. Morris: Applied numerical methods using MATLAB, John Wiley & Sons, Inc., Hoboken, New Jersey, 2005.
 8. J.P. Marques de Sá: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.
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Aktivitas

Minggu 8

Materi Midterm

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Referensi

Aktivitas

Minggu 9

Materi Introduction to computation
- Modeling, computers, and error analysis
- Mathematical modeling, numerical methods, and problem solving
- Software tools

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Referensi

1. S.C. Chapra: Applied Numerical Methods With MATLAB for Engineers and Scientists, McGraw-Hill, Co., Boston, 2005.
2. W.Y. Yang, W. Cao, T.S. Chung, J. Morris: Applied numerical methods using MATLAB, John Wiley & Sons, Inc., Hoboken, New Jersey, 2005.
3. J.P. Marques de Sá: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.

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Minggu 10

Materi MATLAB Fundamentals

- Logical expression
- Vectorization
- If, while, and loop
- Function and m-file
- Introduction to Programming

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MATLAB Software

Referensi

1. S.C. Chapra: Applied Numerical Methods With MATLAB for Engineers and Scientists, McGraw-Hill, Co., Boston, 2005.
2. W.Y. Yang, W. Cao, T.S. Chung, J. Morris: Applied numerical methods using MATLAB, John Wiley & Sons, Inc., Hoboken, New Jersey, 2005.
3. J.P. Marques de Sá: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.

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Minggu 11

Materi System of Linear Equations

- Solution for a System of Linear Equations
- Solving a System of Linear Equations
- Inverse Matrix
- Decomposition (Factorization)
- Iterative Methods to Solve Equations

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Referensi

1. S.C. Chapra: Applied Numerical Methods With MATLAB for Engineers and Scientists, McGraw-Hill, Co., Boston, 2005.
2. W.Y. Yang, W. Cao, T.S. Chung, J. Morris: Applied numerical methods using MATLAB, John Wiley & Sons, Inc., Hoboken, New Jersey, 2005.
3. J.P. Marques de Sá: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.

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Minggu 12

Materi Interpolation and Curve Fitting
- Interpolation by Lagrange Polynomial
- Interpolation by Newton Polynomial
- Interpolation by Cubic Spline
- Curve Fitting

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Referensi 1. S.C. Chapra: Applied Numerical Methods With MATLAB for Engineers and Scientists, McGraw-Hill, Co., Boston, 2005.
2. W.Y. Yang, W. Cao, T.S. Chung, J. Morris: Applied numerical methods using MATLAB, John Wiley & Sons, Inc., Hoboken, New Jersey, 2005.
3. J.P. Marques de Sáacute;: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.

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Minggu 13

Materi Ordinary Differential Equations
- Euler's Method
- Improvement of Euler's Method
- Runge-Kutta Methods
- Systems of Equations

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Referensi 1. S.C. Chapra: Applied Numerical Methods With MATLAB for Engineers and Scientists, McGraw-Hill, Co., Boston, 2005.
2. W.Y. Yang, W. Cao, T.S. Chung, J. Morris: Applied numerical methods using MATLAB, John Wiley & Sons, Inc., Hoboken, New Jersey, 2005.
3. J.P. Marques de Sáacute;: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.

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Minggu 14

Materi Statistics and data processing analysis
- Presenting and summarizing the data
- Parametric tests of hypotheses
- Statistical classification
- Data regression

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- Referensi**
1. S.C. Chapra: Applied Numerical Methods With MATLAB for Engineers and Scientists, McGraw-Hill, Co., Boston, 2005.
 2. W.Y. Yang, W. Cao, T.S. Chung, J. Morris: Applied numerical methods using MATLAB, John Wiley & Sons, Inc., Hoboken, New Jersey, 2005.
 3. J.P. Marques de Sá: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.
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Minggu 15

Materi Case study and project

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Referensi

Aktivitas

Minggu 16

Materi Final examination

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Referensi

Aktivitas
