



Satuan Acara Pengajaran

ENMT800003 - Metode Penelitian & Komputasi

Pengajar

Nofrijon Bin Imam Sofyan Ph.D

Prof. Dr. Ir. Johny Wahyuadi Mudaryoto DEA.

Tujuan Perkuliahan

Setelah mengambil kelas ini, mahasiswa diharapkan sudah memiliki pemahaman bagaimana merencanakan proposal dan penelitian; menulis tesis dan publikasi ilmiah sesuai dengan kaedah-kaedah ilmiah; dan mengetahui sekaligus memahami bagaimana menganalisis metode komputasi untuk memecahkan suatu masalah dan desain dalam bidang teknik metalurgi dan material maupun 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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Media	LCD Projector
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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

Media

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.

Aktivitas

Minggu 10

Materi MATLAB Fundamentals
- Basic Command
- Logical expression
- Vectorization
- Introduction to Programming

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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.

Aktivitas Lecture
Learning by doing

Minggu 11

Materi MatLAB Programming
- m-file and programming
- Flow control if, for, while and switch
- Algorithm, Flowchart, and Pseudocode

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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.

Aktivitas Lecture
Learning by doing

Minggu 12

Materi Case study in Programming:
- Background
- Formulation
- MatLAB Solution
- Exercise

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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.

Aktivitas Case study
Programming

Minggu 13

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.

Aktivitas Lecture

Minggu 14

Materi Statistic with MatLAB
- Basic statistical command
- Hypothesis testing: z-test, t-test, two sample t-test
- Introduction to analysis of variance

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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 ANOVA with MatLAB:
- One-way, Two-way, and n-way ANOVA
- Case Study
- Final Project

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Referensi B. Hunt, R. Lipsman, J. Rosenberg, K. Coombes, J. Osborn, G. Stuck: A Guide to MATLAB for Beginners and Experienced Users, Cambridge University Press, Cambridge, UK 2001.
S.C. Chapra: Applied Numerical Methods With MATLAB for Engineers and Scientists, McGraw-Hill, Co., Boston, 2005.
W.Y. Yang, W. Cao, T.S. Chung, J. Morris: Applied numerical methods using MATLAB, John Wiley & Sons, Inc., Hoboken, New Jersey, 2005.
J.P. Marques de Sá: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.

Aktivitas Lecture
Learning by doing

Minggu 16

Materi Final examination

Media

Referensi
