



Satuan Acara Pengajaran

ENMT801003 - Metode Penelitian & Komputasi

Pengajar

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

Nofrijon Bin Imam Sofyan Ph.D

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	<ol style="list-style-type: none">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 S&aacute;acutec: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.
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Aktivitas

Minggu 2

Materi Perception of Research
- Meaning
- Definition
- Objective
- Classification

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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. L. Blaxter, C. Hughes, and M. Tight: How to Research, 3rd ed., Open University Press, Berkshire, UK, 2006.
4. Y. K. Singh: Fundamental of Research Methodology and Statistics, New Age International (P) Ltd., Publishers, New Delhi, 2006.

Aktivitas Interactive Lecture
Discussion

Minggu 3

Materi Assortment of Problems
- Scientific thinking
- Identification of problem
- Defining a problem
- Clarifying and stating a problem
- Research proposal

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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. L. Blaxter, C. Hughes, and M. Tight: How to Research, 3rd ed., Open University Press, Berkshire, UK, 2006.
4. Y. K. Singh: Fundamental of Research Methodology and Statistics, New Age International (P) Ltd., Publishers, New Delhi, 2006.

Aktivitas Interactive Lecture
Discussion

Minggu 4

Materi Appraise of Related Literature
- Meaning of review literature
- Objective of literature review
- Sources of literature
- Precautions in library use

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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. L. Blaxter, C. Hughes, and M. Tight: How to Research, 3rd ed., Open University Press, Berkshire, UK, 2006.
4. Y. K. Singh: Fundamental of Research Methodology and Statistics, New Age International (P) Ltd., Publishers, New Delhi, 2006.

Aktivitas Interactive Lecture
Discussion

Minggu 5

Materi How to Write A Research Proposal
- Title
- Introduction
+ Background
+ Aim
+ Objectives
+ Scope
+ Hypothesis
- Literature Review
- Methodology/Experimental Setup
+ Timetable (Thrust and Task)
+ Financial Consideration (Financier/sponsor)
- References

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Laptop
Internet Connection

- Referensi**
1. C. R. Kothari: Research Methodology, Methods & Techniques, New Age International (P) Ltd., Publishers, New Delhi, 2004.
 2. L. Blaxter, C. Hughes, and M. Tight: How to Research, 3rd ed., Open University Press, Berkshire, UK, 2006.
 3. Dissertation proposals & writing dissertations, available at <http://mycourse.solent.ac.uk/mod/book/view.php?id=2744&chapterid=1300>
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Aktivitas

- Journal Survey
- Keywords Searching
- Literature Searching

Minggu 6

Materi

- How to Write a Research Paper
 - The concept
 - Type of manuscripts
 - Writing Process
 - General Structure of a Journal Paper

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- Laptop
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Referensi

1. Elsevier: How to Write a World Class Paper, From Title to References, from Submission to Revision, September 2009
2. P. Kamat: How to Write an Effective Research Paper, <http://www.nd.edu/~pkamat>

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- Interactive Lecture
- Journal Survey

Minggu 7

Materi

- English Writing Technique
 - Introduction
 - Computer Spellchecker & grammar
 - Common errors and problems
 - Good English structure in a scientific paper

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- Referensi**
1. G. D. Gopen and J.A. Swan: American Scientist, 78, (1990) pp. 550-558.
M. A. Marlow: Writing scientific articles like a native English speaker: top ten tips for Portuguese speakers, Clinics, 69(3) (2014) pp. 153-157
 2. S. Dardjowidjojo: Language mastery for scientific articles, Penataran Penulisan Ilmiah DP2M Unika Atma Jaya (2009)
 3. W. H. Fowler: The Oxford Guide to Modern English Usage (1983)
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- Interactive Lecture
- Discussion
- Journal survey

Minggu 8

Materi Midterm

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Referensi

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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 Sáaacute: 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

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Minggu 16

Materi Final examination

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