



# Satuan Acara Pengajaran

ENMT801003 - Metode Penelitian & Komputasi

Pengajar

*Nofrijon Bin Imam Sofyan Ph.D*

## Minggu 1

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<b>Materi</b>	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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<b>Media</b>	LCD Projector
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<b>Referensi</b>	<ol style="list-style-type: none"><li>1. C. R. Kothari: Research Methodology, Methods &amp; Techniques, New Age International (P) Ltd., Publishers, New Delhi, 2004.</li><li>2. G. Marczyk, D. DeMatteo, and D. Festinger: Essentials of Research Design and Methodology, John Wiley &amp; Sons, Inc., Hoboken, New Jersey, 2005.</li><li>3. J. M. Ruane: Essentials of research methods: a guide to social science research, Blackwell Publishing, Malden, 2005.</li><li>4. L. Blaxter, C. Hughes, and M. Tight: How to Research, 3rd ed., Open University Press, Berkshire, UK, 2006.</li><li>5. Y. K. Singh: Fundamental of Research Methodology and Statistics, New Age International (P) Ltd., Publishers, New Delhi, 2006.</li><li>6. S.C. Chapra: Applied Numerical Methods With MATLAB for Engineers and Scientists, McGraw-Hill, Co., Boston, 2005.</li><li>7. W.Y. Yang, W. Cao, T.S. Chung, J. Morris: Applied numerical methods using MATLAB, John Wiley &amp; Sons, Inc., Hoboken, New Jersey, 2005.</li><li>8. J.P. Marques de S&amp;aacute;acutecute: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.</li></ol>
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## Aktivitas

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## Minggu 2

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

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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. L. Blaxter, C. Hughes, and M. Tight: How to Research, 3rd ed., Open University Press, Berkshire, UK, 2006.
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**Aktivitas** Interactive Lecture  
Discussion

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## Minggu 3

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

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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. 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.

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**Aktivitas** Interactive Lecture  
Discussion

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## Minggu 4

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

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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. 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.

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**Aktivitas** Interactive Lecture  
Discussion

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## Minggu 5

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**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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**Media** LCD Projector  
Laptop  
Internet Connection

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- 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

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## Minggu 6

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**Materi**

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

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**Media**

- LCD Projector
- Laptop
- Internet Connection

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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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**Aktivitas**

- Interactive Lecture
- Journal Survey

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## Minggu 7

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**Materi**

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

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**Media**

- LCD Projector
- Laptop
- Internet Connection

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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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**Aktivitas**

- Interactive Lecture
- Discussion
- Journal survey

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## Minggu 8

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**Materi** Midterm

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**Media**

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**Referensi**

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## Minggu 9

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**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 S&aacute;aacute;: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.

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## Minggu 10

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**Materi** MATLAB Fundamentals  
- Logical expression  
- Vectorization  
- If, while, and loop  
- Function and m-file  
- Introduction to Programming

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**Media** LCD Projector  
MATLAB Software

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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 S&aacute;: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.

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## Minggu 11

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**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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**Media** LCD Projector

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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 S&aacute;: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.

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## Minggu 12

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**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 S&aacute;: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.

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## Minggu 13

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

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**Media** LCD Projector

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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 S&aacute;: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.

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## Minggu 14

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**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 S&aacute;: Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer-Verlag Berlin Heidelberg 2007.
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Minggu 15

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**Materi** Case study and project

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**Media**

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**Referensi**

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**Aktivitas**

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Minggu 16

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**Materi** Final examination

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**Media**

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**Referensi**

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**Aktivitas**

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