

Mata Kuliah Semester I
Program Studi Magister Teknik Sistem
Program Pascasarjana Fakultas Teknik - Universitas Gadjah Mada

Asas dan Penerapan Teknik Sistem (TKMTS 176101 - 3 SKS)

Topik:

- a. Definisi dan konsep sistem
- b. Model-model sistem
- c. Proses desain sistem
- d. Tools untuk analisa sistem
- e. Konsep dan kerangka rancangan sistem
- f. Pengembangan dan penerapan sistem
- g. Studi kasus

Pustaka:

- a. DAU, 2001, *System Engineering Fundamentals*, the Defense Acquisition University Press, FortBelvoir.
- b. CheckLand, P., 1999, *System Thinking, Systems Practice*, John Wiley and Son, Chichester, England.
- c. Blanchard, B.S. and W.J. Fabrycky, 1997, *Systems Engineering and Analysis*, Prentice Hall. Third Edition ISBN 0-13-135047-1
- d. Mar, B., 1996, *Engineering of Complex Systems*, University of Washington Monograph.
- e. Flood, L.R., and N.J.Jackson, 1991, *Creative Problem Solving: Total System Intervention*, John Wiley and Son, Chichester, England.

Pemodelan dan Simulasi Dinamika Sistem (TKMTS 176102 - 3 SKS)

Topik:

- a. Model sistem, sistem dinamik dan sifat-sifatnya.
- b. Definisi masalah dan karakterisasi sistem.
- c. Similaritas model-model sistem dinamis.
- d. Penyusunan dan pengembangan model dinamis.
- e. Simulasi model, estimasi parameter dan validasi model berdasarkan pendekatan asumsi dan *response (behaviour)*.
- f. Experimen dengan model.
- g. Analisis sensitivitas, analisis performansi.
- h. Studi perbandingan berbagai alternatif model.
- i. Pemanfaatan *software* komputer dan *simulation tools* dalam analisis sistem dinamik, penerapan model: studi kasus.

Pustaka:

- a. Hybertson,D.W., 2009, *Model-Oriented Systems Engineering Science: A Unifying Framework for Traditional and Complex Systems*, CRC Press.
- b. Kulakowski,B.T., J. F. Gardner, J. L. Shearer, 2007, *Dynamic Modeling and Control of Engineering Systems*, Cambridge University Press, New York, USA.
- c. Fishwick,P.A., 2007, *Handbook of Dynamic Systems Modeling*, Chapman & Hall/CRC.
- d. Esfandiari,R., B. Lu, 2005, *Modeling and Analysis of Modeling Systems*, CRC.
- e. Coyle, R.G., 1996, *System Dynamic Modelling, A practical Approach*, London, Chapman and Hall.

Manajemen Operasi (TKMITS 176103 - 2 SKS)

Topik:

- a. Pendahuluan: integrasi antara pengetahuan Teknik Sistem dan Manajemen dari segi perangkat-keras, perangkat-lunak, dan kebijakan.
- b. Pembinaan SDM.
- c. *Entrepreneurship*.
- d. Moral Etika.
- e. Model Manajemen Kualitas: TQM, dan 6 Sigma.
- f. *Forecasting* dan *Supply Chain Management*.
- g. Model linier dalam manajemen operasi.
- h. Model jaringan (*network model*) dan metode jalur kritis.
- i. Kunjungan lapangan dan studi kasus.

Pustaka:

- a. Winston, W.L., S. C. Albright, 2006, *Practical Management Science*, 3rd ed., South-Western College Pub. SBN 0534465129.
- b. Bicheno, J., B.R. Elliott, 1997, *Operations Management: An Active Learning Approach*, Wiley.
- c. Blanchard, B.S., 1991, *System Engineering Management*, 4th edition, Wiley.
- d. Heizer, J., B. Render, 1991. *Production and Operation Management*, Allyn and Bacon, Sydney.

Statistika Multivariat (TKMITS 176104 - 3 SKS)

Topik:

- a. Prinsip-prinsip probabilitas dan statistika.
- b. Model-model probabilitas dan distribusi.
- c. Analisis dan evaluasi parameter model-model probabilitas dan distribusi.
- d. Tingkat kepercayaan dan uji-uji statistika.
- e. Analisis stasioneritas, nonstasioneritas dan runtun waktu (*time series*).
- f. Analisis dan pengolahan data *multivariate*.
- g. *Dependence Techniques (multiple regression analysis, Multiple discriminant analysis and logistic regression, multivariate analysis of variance, conjoint analysis)*.
- h. *Interdependence Techniques (cluster analysis, multidimensional scaling and correspondence analysis), structural Equation Modeling (SEMs)*
- i. Aplikasi perangkat lunak statistika.

Pustaka:

- a. J.F. Fair, Jr., W.C. Black, B.J. Babin, R.E. Anderson, and R.L. Tatham, 2006, *Multivariate Data Analysis*, Pearson Int. Edition, New York.
- b. Hayter, A.J., 2006, *Probability and Statistics for Engineers and Scientists (with CD-ROM)*, PWS Publishing Company
- c. Hines, W.W., D.C. Montgomery, D.M. Goldsman, and C.M. Borror, 2003, *Probability and Statistics in Engineering*, John Wiley & Sons, Hoboken, New Jersey
- d. Box G.E.P., W.G. Hunter, and J.S. Hunter, 1978, *Statistics for Experimenters: An Introduction to Design, Data Analysis, and Model Building*, John Wiley & Sons, New York

Metodologi Penelitian dalam Teknik Sistem (TKMITS 176105- 2 SKS)

Topik:

Proses dan langkah dalam penelitian teknik sistem yang meliputi perumusan masalah, studi pustaka, hipotesis, perancangan, eksperimen, pelaksanaan penelitian, pengolahan

data, analisis data, penulisan laporan dan penarikan kesimpulan.

Pustaka:

- a. Anonim, 2003, Panduan Penyusunan Tesis, Sekolah Pascasarjana UGM.
- b. Wood, M.F., 2000, *Multiagent Systems Engineering: A Methodology for Analysis and Design of Multiagent Systems*, Springer-Verlag.
- c. Holman, J.P. and W.J.Gajda Jr, 1984, *Experimental Methods for Engineers*, 3rd ed., McGraw-Hill Book Company, Inc., New York.
- d. Wymore, A.W.,1976, *Systems Engineering Methodology for Interdisciplinary Teams*, John Wiley & Sons.