

SILABUS KURIKULUM/COURSE SYLLABUS

MATA KULIAH/ COURSE TITLE	TI091201 : Pengantar Ilmu Ekonomi TI091201 : <i>Introduction to Economics</i> Credits: 2 Semester: I
TUJUAN PEMBELAJAR AN/LEARNING OBJECTIVES	Mengenal dan memahami konsep dasar ilmu ekonomi, baik secara makro maupun mikro. <i>To understand the basic concept of microeconomics and macroeconomics as well.</i>
KOMPETENSI/ COMPETENCI ES	<ul style="list-style-type: none"> • Perancang sistem • Keterampilan manajerial • Intrapersonal dan kemampuan berkomunikasi • <i>System designer</i> • <i>Managerial skills</i> • <i>Intrapersonal and communication skills</i>
POKOK BAHASAN/SU BJECTS	<ol style="list-style-type: none"> 1. Konsep dan Pengertian Dasar Ilmu Ekonomi. 2. Teori Ekonomi :Permasalahan dalam Ekonomi,Hukum Kelangkaan dan Pemilihan, Teori Permintaan dan Penawaran. 3. Teori Ekonomi Mikro dan Makro, Struktur Pasar, meliputi : Monopoli, Oligopoli, Persaingan Sempurna dll 4. Teori Produksi dan Biaya-Biaya, Konsumsi, Tabungan dan Investasi, Pertumbuhan dan Perkembangan Ekonomi, Pendapatan Nasional : Konsep, Perhitungan dan Distribusi 5. Kebijakan Fiskal dan Kebijakan Moneter. <ol style="list-style-type: none"> 1. <i>Basic concept of economics</i> 2. <i>The theory of economics: issues in economics, scarcity law and selection, demand and supply functions.</i> 3. <i>Macroeconomics and microeconomics theory, market structure; includes: monopoly, oligopoly, and monopolistic competition.</i> 4. <i>Production and cost theory, consumption, saving and investment, economics development and growth, national income: the concept, calculation, and distribution.</i> 5. <i>Fiscal and monetary policy.</i>
PUSTAKA UTAMA/	<ol style="list-style-type: none"> 1. Samuelson, Paul A. (1989). <i>Economics</i>. Tokyo : Mc Graw-Hill Kogakusha Ltd. 2. Russel, R and M. Wilkonson (1979). <i>Microeconomics : A</i>

REFERENCES	<p><i>Synthesis of Modern and Neoclassical Theory</i>. John Willey and Sons, New York.</p> <p>3. Agus Salim, Soeharsono S dan Ali Basyah Siregar (1997). <i>Analisis Tekno Ekonomi</i>. Program Pasca Sarjana ITB Bandung.</p> <p>4. Nellis, J.G; D. Parker (2000). <i>The Essence of the Economy</i>. Prentice Hall International.</p>
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MATA KULIAH/ COURSE TITLE	<p>TI091202 : Menggambar Teknik TI091202 :Engineering Drawing</p> <p>Credits: 2</p> <p>Semester: I</p>
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TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES	<p>Dalam mata kuliah ini mahasiswa dibimbing untuk mengenal dan memahami kegunaan alat-alat gambar, aturan-aturan dasar yang dipergunakan untuk mewujudkan gambar teknik serta mampu membaca gambar dan membayangkan bentuk gambar tersebut untuk kepentingan proses produksi maupun pengembangan produk. Selain itu juga memberikan pemahaman tentang aplikasi CAD (Computer Aided Design) dalam mewujudkan gambar utuh.</p> <p><i>In this course students are guided to know and understand the use of drawing equipments, basic rules used to realize engineering drawing, as well as how to interpret an engineering drawing and imagine the shape of the drawing for production process purpose and product development. Also discussed in this course is the application of Computer Aided Design (CAD) to create a full drawing of an object.</i></p>
KOMPETENSI/COMPETENCY	<ul style="list-style-type: none"> • Ketrampilan Sintesis, integrasi, dan perancangan • Ketrampilan memanfaatkan teknologi informasi • Kemampuan berinovasi • <i>Synthesizing, integrating, and designing skills</i> • <i>Proficiency in ICT</i> • <i>Innovating skills</i>
POKOK BAHASAN/SUBJECTS	<ul style="list-style-type: none"> • Pengantar menggambar teknik • Pengumpulan informasi dan data suatu gambar produk

	<ul style="list-style-type: none"> • Ide rancangan produk dan mewujudkannya dalam sketsa awal • Pematangan konsep rancangan produk sesuai dengan standar internasional menggambar teknik • Mewujudkan rancangan produk dalam visualisasi yang lebih lengkap dan komunikatif. • <i>Introduction to Engineering Drawing</i> • <i>Information gathering of an object or product for drawing purpose</i> • <i>Idea generation and how visualize it in a sketch</i> • <i>Concept enhancement using the international standard of engineering drawing</i> • <i>Design visualization and a more complete and communicative way.</i>
PUSTAKA UTAMA/REFERENCES	<ol style="list-style-type: none"> 1. Groover, Mikell P and E.W, JR., <u>CAD/CAM : Computer Aided Design and Manufacturing</u>, Prentice Hall, 1987 2. Jensen, C.H., and Helsaed, <u>Fundamentals of Engineering Drawing</u>, Mac Graw Hill Co., 1987 3. Luzadder, Waren J., <u>Fundamentals of Engineering Drawing (With an Introduction to Interactive Computer Graphic for Design and Production)</u>, 9th edition, Prentice Hall, 1986 4. Sato, Takeshi G., dan N. Sugiharso H., <u>Menggambar Mesin Menurut Standar ISO</u>, Pradnya Paramitha, 1996

MATA KULIAH/ COURSE TITLE	TI091301 : Pengantar Teknik Industri TI091301 :Introduction to Industrial Engineering Credits: 2 Semester: I
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TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES	Mata kuliah ini bertujuan untuk memberikan pemahaman kepada mahasiswa mengenai latar belakang, ruang lingkup, dan perkembangan disiplin teknik industri, pemahaman tentang kebutuhan dunia kerja terhadap profesi seorang sarjana teknik industri dalam hal <i>hard</i> dan <i>soft skills</i> . Termasuk di dalam mata kuliah ini adalah kerangka keilmuan teknik industri, pengertian sistem dan konteksnya sehingga mahasiswa
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	<p>dapat menjelaskan cara berpikir system.</p> <p><i>This course provides students with understanding of the background, scope, and development of industrial engineering discipline, understanding about competencies requirements of an industrial engineer profession in terms of hard and soft skills. It includes industrial engineering science framework, system definition and its context so that students will be able to explain system thinking.</i></p>
<p>KOMPETENSI/COMPETENCY</p>	<ul style="list-style-type: none"> • Perancang Sistem • Ketrampilan Sintesis, integrasi, dan perancangan • Ketrampilan Manajerial • <i>System designer</i> • <i>Synthesizing, integrating, and designing skills</i> • <i>Managerial skills</i>
<p>POKOK BAHASAN/SUBJECTS</p>	<ul style="list-style-type: none"> • Student Centered Learning (SCL), Basic Learning Skills • Sejarah perkembangan teknik industri, konsep ruang lingkup, dan peranan disiplin teknik industri • Profil dan kompetensi sarjana teknik industri • Konsep sistem dan pendekatan sistem, pendekatan bisnis proses terintegrasi dengan CIMOSA, <i>Macro interactions</i> • Kerangka keilmuan dan <i>building blocks</i> teknik industri, kerangka sistem manufaktur dan sistem industri jasa, kerangka proses pengembangan produk, kerangka proses <i>get order</i> dan <i>order fulfillment</i> • <i>Student Centered Learning (SCL), Basic Learning Skills</i> • <i>History of industrial engineering development, scope concept, and roles of industrial engineering discipline</i> • <i>Profile and competencies requirements of Industrial Engineer</i> • <i>The concept of system and system approaches, integrated business process approach by CIMOSA, Macro interactions</i> • <i>Industrial engineering science framework and building blocks, manufacturing and services</i>

	<i>industries system frameworks, product development process framework, get order and order fulfillment process framework.</i>
PUSTAKA UTAMA/REFERENCES	<ol style="list-style-type: none"> 1. Wignjosoebroto, S. (2003) <i>Pengantar Teknik dan Manajemen Industri</i>, Guna Widya, Surabaya. 2. Turner, W. (1993) <i>Introduction to Industrial and System Engineering</i>, Prentice Hall, New York. 3. Hicks, P. E. (1994) <i>Industrial Engineering and Management: A New Perspective</i>, McGraw-Hill, Tokyo. 4. Daellenbach, H. G. & McNickle, D. C. (2005) <i>Management Science: Decision Making through Systems Thinking</i>, Palgrave Macmillan, New York.

MATA KULIAH/ COURSE TITLE	TI091204 : Algoritma dan Pemrograman Komputer TI091204 : <i>Algorithms and Computer Programming</i> Credits: 3 Semester: II
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TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES	<p>Memahami jenis bahasa-bahasa pemrograman, tujuan penggunaannya, serta aplikasinya untuk merealisasikan algoritma-algoritma penyelesaian masalah tertentu. Lebih lanjut, mata kuliah ini bertujuan untuk mengembangkan kemampuan pemanfaatan teknologi komputer dan informasi untuk perancangan, perbaikan, pemasangan dan pengoperasian sistem terintegrasi.</p> <p><i>To provide students with an understanding of types of programming language, its purposes, and applications to realize algorithms as solving methods. It aims to develop students' ability in ICT implementation for designing, improving, installing, and operating integrated system.</i></p>
KOMPETENSI/COMPETENCY	<ul style="list-style-type: none"> • Keterampilan memecahkan masalah • Keterampilan memanfaatkan teknologi informasi • Keterampilan analisis • <i>Problem solving skills</i>

POKOK BAHASAN/SUBJECTS	<ul style="list-style-type: none"> • <i>Proficiency in ICT</i> • <i>Analytical skills</i>
	<ul style="list-style-type: none"> • Dasar-dasar bahasa pemrograman • <i>Programming language and its foundation</i>
PUSTAKA UTAMA/REFERENCES	N/A

MATA KULIAH/ COURSE TITLE	TI091302 : Proses Manufaktur TI091302 : <i>Manufacturing Process</i> Credits: 3 Semester: II
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TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES	<p>Mata kuliah ini membahas tentang proses-proses yang ada dalam industri manufaktur khususnya yang memproduksi barang atau komponen yang diskrit. Disajikan pula tentang <i>design for manufacture</i> yang ditujukan untuk mendapatkan rancangan proses manufaktur yang paling efisien untuk membuat produk tersebut.</p> <p><i>This course discusses about production process in manufacturing industry, especially those with discrete products or components. It also provides students with design for manufacture of which aims to obtain the best manufacturing design that is most efficient in producing certain product.</i></p>
KOMPETENSI/COMPETENCY	<ul style="list-style-type: none"> • Perancang Sistem • Keterampilan Sintesis, integrasi, dan perancangan • Keterampilan memecahkan masalah • <i>System designer</i> • <i>Synthesizing, integrating, and designing skills</i> • <i>Problem solving skills</i>
POKOK BAHASAN/SUBJECTS	<ul style="list-style-type: none"> • Pengecoran, pembentukan: pembentukan kondisi panas dan pembentukan kondisi dingin. • Permesinan dan metalurgi serbuk • Teknologi non-logam.

	<ul style="list-style-type: none"> • Permesinan non tradisional: <i>chemical machining, electrochemical grinding, EDM, Water Jet Machining, Laser Beam Machining, DFM, dll.</i> • Pengelasan dan perakitan mekanis. • <i>Casting, forming: hot forming and cold forming.</i> • <i>Machining and powder metallurgy.</i> • <i>Non-metal technology.</i> • <i>Non-conventional machining: chemical machining, electrochemical grinding, EDM, Water Jet Machining, Laser Beam Machining, DFM, etc.</i> • <i>Welding and mechanical assembly.</i>
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PUSTAKA UTAMA/REFERENCES	<ol style="list-style-type: none"> 1. De Garmo, E. P.D. (1979), <i>Material and Processes in Manufacturing</i>, New York, Collier Mc Millan Publ, 2. Kalpakjan, Seroke (1995), <i>Manufacturing Engineering and Technology</i>, Third Edition, Addison-Wesley Pub. Company, 3. Pandey, PC. (1983), <i>Modern Manufacturing Processes</i>, Second Edition, Tata Mc. Graw Hill Publishing Company Ltd. 4. Geough, JA. (1988), <i>Advanced Methods of Machining</i>, First Edition, Chapman and Hall Ltd. 5. Gershwin, Stanley B. (1994), <i>Manufacturing Systems Engineering</i>, Prentice Hall. 6. Schey, John A. (1987), <i>Introduction to manufacturing Processes</i> Second Edition, Mc Graw-Hill Book Co.
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MATA KULIAH/ COURSE TITLE	TI091303 : Statistik Industri I TI091303 :Industrial Statistics I Credits: 3 Semester: II
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TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES	Memahami dan menguasai cara-cara untuk mendapatkan berbagai macam data (sampling), mendeskripsikan data (statistik deskriptif) dan mengambil kesimpulan terhadap data. Memahami dan menguasai tentang teori kemungkinan (probabilitas), distribusi probabilitas baik diskrit maupun kontinyu.
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	<p>Memahami dan mampu menerapkan konsep statistik inferensi, khususnya estimasi parameter.</p> <p><i>To provide students with an understanding of various methods to obtain samples (sampling methods), ability to describe data (descriptive statistics) and to draw conclusion regarding the data. It reviews probability theory, probabilistic distribution both discrete and continuous. It aims to develop students' ability to understand and implement the concept of inferential statistics, especially parameter estimation.</i></p>
<p>KOMPETENSI/COMPETENCY</p>	<ul style="list-style-type: none"> • Keterampilan memecahkan masalah • Keterampilan memanfaatkan teknologi informasi • Keterampilan analisis • <i>Problem solving skills</i> • <i>Proficiency in ICT</i> • <i>Analytical skills</i>
<p>POKOK BAHASAN/SUBJECTS</p>	<ul style="list-style-type: none"> • Pengertian statistik deskriptif dan statistik inferensial • Distribusi Sampling dan Teorema Limit Pusat • Konsp Ilmu Peluang (probabilitas) dan distribusi frekuensi • Jenis-jenis distribusi probabilitas, baik diskrit maupun kontinyu, seperti : Binomial, Poisson, Geometric, Hipergeometrik, Eksponensial, Weibull, Normal • Estimasi parameter dan selang kepercayaan • <i>Descriptive and inferential statistics review</i> • <i>Sampling distribution and Central Limit Theorem</i> • <i>Probability concept and frequency distribution</i> • <i>Probability distributions (discrete & continuous): Binomial, Poisson, Geometric, Hypergeometric, Weibull, and Normal distribution.</i>
<p>PUSTAKA UTAMA/REFERENCES</p>	<ul style="list-style-type: none"> • Walpole, R.E, Raymond H. Myers, S.H. Myers, Keying Ye, <u>Probability and Statistics for Engineers and Scientists 7th ed</u>, New Jersey, Prentice Hall Inc., 2002. • Ross, Sheldon, <u>A First Course in Probability</u>

4th ed., Prentice Hall Int, 1994.

- Kvanli, Alan H, R.J Pavur, K. B. Keeling, Introduction to Business Statistics 6th ed., Thomson South Western, 2003.
- Mendenhall, William, Terry Sincich, Statistic for Engineering and the Sciences 4th ed., Prentice Hall International Inc., 1995.
- Iman, Ronald L. & J Conover, Modern Business Statistics, New York, John Wiley and Sons, 1983.

**MATA KULIAH/
COURSE
TITLE**

**TI091207 : Analisis dan Estimasi Biaya
TI091207 : *Cost Estimation and Analysis***

Credits: 3

Semester: III

**TUJUAN
PEMBELAJARAN/LEARNING
OBJECTIVES**

Analisis biaya adalah mata kuliah yang akan memberikan mahasiswa mengenai wawasan dan pengetahuan mengenai hal-hal yang terkait dengan keuangan perusahaan, dimulai dari proses akuntansinya hingga melakukan analisis penggunaan laporan akuntansi tersebut. Tujuan kuliah ini untuk memberikan pemahaman dasar kepada mahasiswa tentang konsep dasar proses akuntansi keuangan mulai dari transaksi, jurnal, buku besar sampai dengan laporan keuangan, memberikan pemahaman dasar tentang biaya dan perilakunya serta pembebanannya sesuai dengan jenis industrinya, memberikan pemahaman dasar tentang sistem biaya berbasis aktivitas dan pengelolaan usaha berbasis aktivitas, mengevaluasi dan menganalisa kinerja keuangan usaha atas dasar laporan akuntansi dan menggunakan akuntansi sebagai alat untuk memahami bisnis/usaha.

The course provides students with knowledge of aspects related to corporates' financial, from the accounting process to the analysis of accounting reports. It aims to give students understanding about basic concept of financial accounting reports including transaction, journals, ledger, and accounting reports. It also discusses about various costs, cost's behaviour and allocation based on the type of industry. Furthermore, the course explores about activity based cost,

KOMPETENSI/COMPETENCY	<p><i>managing activity based business, evaluating and analyzing financial performance based on accounting reports and use it as a medium to understand a business.</i></p>
	<ul style="list-style-type: none"> • Keterampilan memecahkan masalah • Ketrampilan manajerial • Perancang sistem • <i>Problem Solving Skills</i> • <i>Managerial Skills</i> • <i>System Designer</i>
POKOK BAHASAN/SUBJECTS	<ul style="list-style-type: none"> • Akuntansi dan kegiatan usaha. • Analisa transaksi, konsep penandingan dan proses penyesuaian, siklus akuntansi, sistem akuntansi dan pengendalian internal. • Konsep tentang biaya dan perilakunya, estimasi biaya dan analisis varian. • Sistem biaya atas dasar pesanan, sistem biaya atas dasar proses, dan sistem biaya atas dasar aktifitas. • Analisis laporan keuangan. • <i>Accounting and business activity.</i> • <i>Transactiona analysis, comparison method and adjusting process, accounting cycle, accounting system, and internal control.</i> • <i>The concept of cost and its behaviour, cost estimation and variance analysis.</i> • <i>Order based costing, process based costing, and activity based costing.</i> • <i>Financial report analysis.</i>
PUSTAKA UTAMA/REFERENCES	<ol style="list-style-type: none"> 1. Jones, K.H., "Introduction to Financial Accounting, A User Perspective", Prentice Hall, 2004. 2. Hilton, "Managerial Accounting", 5th, McGraw Hill, 2008. 3. Grant & Bell, "Basic Accounting & Cost Accounting", 2nd, McGraw Hill, 1964. 4. Gray & Ricketts, "Cost & Managerial Accounting", McGraw Hill, 1982. 5. Soemarso, S.R., "Akuntansi Suatu Pengantar", Salemba Empat, 2007.

**COURSE
TITLE**

T1091208 : Optimization Mathematics I

Credits: 3

Semester: III

**TUJUAN
PEMBELAJARAN/LEARNING
OBJECTIVES**

Mata kuliah ini mengenalkan mahasiswa dengan teknik dasar aljabar linier, termasuk didalamnya topik-topik tentang vector, matriks, vector space dan subspace, dan linear transformations.

Mahasiswa diajak mengeluti mathematical reasoning, proofs, dan abstract structures.

The course provides students with basic techniques of linear algebra, including topics related to vectors, matrices, vector spaces and subspaces, and linear transformations. It critically reviews mathematical reasoning, proofs, and abstract structures.

KOMPETENSI/COMPETENCY

- Keterampilan memecahkan masalah
- Keterampilan memanfaatkan teknologi informasi
- Perancang sistem
- *Problem solving skills*
- *Proficiency in ICT*
- *System designer*

**POKOK
BAHASAN/SUBJECTS**

Sistem Persamaan Linier, Metode Eliminasi, Matriks dan Operasi-operasinya, Ekspansi Kofaktor, Determinan, Aturan Cramer, Vektor, Dot Product, Proyeksi Orthogonal, Cross Product, Scalar, Triple Product, Kombinasi Linier, Merentang (Span), Vektor Bebas Linier, Koordinat, Basis dan Dimensi, Proses Gram-Schmidt, Dekomposisi QR, Least Squares Fitting to Data, Perubahan Basis, Nilai Eigen dan Vektor Eigen, Diagonalisasi, Diagonalisasi Orthogonal, Transformasi Linier Secara Umum, Kernel dan Range, Invers, Transformasi Linier, Matriks Transformasi, Similaritas.

Linear equation system, Elimination methods, Matrix and its operations, Cofactor Expansion, Determinant, Cramer rule, Vector, Dot Product, Orthogonal Projection, Cross Product, Scalar, Triple Product, Linear Combination, Span, Linear

PUSTAKA UTAMA/REFERENCES	<p><i>Free Vector, Coordinate, Basis and Dimension, Gram-Schmidt Process, QR Decomposition, Least square fitting to data, Basis Change, Eigen value and Eigen vector, Diagonalization, Orthogonal diagonalization, General Linear Transformation, Kernel and Range, Inverse, Linear Transformation, Transformation Matrix, Similarity.</i></p> <hr/> <p>Anton H., <u>Elementary Linear Algebra 9th Edition</u>, Wiley Linear Algebra Jim Hefferon, Ebook.</p>
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MATA KULIAH/ COURSE TITLE	<p>TI091209 : Otomasi Industri TI091209 : <i>Industrial Automation</i></p> <p>Credits: 2 Semester: III</p>
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TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES	<p>Kuliah ini memberikan pemahaman tentang peran otomasi dalam mendukung proses bisnis di bidang manufaktur dan jasa serta pengetahuan dasar suatu sistem otomasi. Pada akhir perkuliahan mahasiswa diharapkan mampu mengidentifikasi kebutuhan otomasi serta menganalisa aspek teknis dan non teknis perancangan sistem otomasi dalam suatu sistem manufaktur dan jasa.</p> <p><i>This course provides students understanding about the roles of automation to support business process in manufacturing and services as well as the basic knowledge of automation system. By the end of the course students are expected to show their capabilities to identify the requirements of automation and to analyze technical and non-technical aspects in automation system design of manufacturing and services.</i></p>
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KOMPETENSI/COMPETENCY	<ul style="list-style-type: none"> • Perancang Sistem • Ketrampilan Sintesis, integrasi, dan perancangan • Ketrampilan Manajerial • <i>System designer</i> • <i>Synthesizing, integrating, and designing skills</i>
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<p>POKOK BAHASAN/SUBJECTS</p>	<ul style="list-style-type: none"> • <i>Managerial skills</i> <hr/> <ul style="list-style-type: none"> • Pengantar otomasi industri, jenis-jenis dan level otomasi, penerapan otomasi pada sistem industri manufaktur. • Logika otomasi, sensor, aktuator, komponen sistem kontrol, dan hasil-hasil proses sensing. • Fuzzy logic control, sistem kendali, ladder diagram. • Elektronika dan microprocessor. • Perancangan otomasi industri. • <i>Introduction to industrial automation, automation types and levels, automation application in manufacturing.</i> • <i>Automation logic, sensor, actuator, components of control system, sensing process output.</i> • <i>Fuzzy logic control, control system, ladder diagram.</i> • <i>Electronics and microprocessors.</i> • <i>Design of industrial automation.</i>
<p>PUSTAKA UTAMA/REFERENCES</p>	<ol style="list-style-type: none"> 1. Groover, MP 2001, <u>Automation, Production Systems, and Computer – Integrated Manufacturing</u>, 2nd edition, Prentice Hall, New Jersey 2. Soloman, S 1994, <u>Sensors and Control Systems in Manufacturing</u>, McGraw-Hill, New York 3. Toncich, DJ 1993, <u>Data Communications and Networking for Manufacturing Industries</u>, Chrystobel Engineering, Brighton 4. Toncich, DJ 1994, <u>Computer Architecture and Interfacing to Mechatronic Systems</u>, Chrystobel Engineering, Brighton 5. http://oeiwcs.omron.com/ 6. http://www.autodev.com/ADI_Catalog/11.htm 7. http://www.roboticsonline.com 8. http://www.seikorobots.com

<p>MATA KULIAH/ COURSE</p> <p>TITLE</p>	<p>T1091304 : Statistik Industri II T1091304 : <i>Industrial Statistics II</i></p> <p>Credits: 3 Semester: III</p>
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<p>TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES</p>	<p>Memahami dan memiliki kemampuan dalam menggunakan salah satu metode pengambilan keputusan dalam statistik inferensial, yaitu pengujian hipotesa baik parametrik maupun non-parametrik, Memiliki kemampuan serta mampu membangun model-model hubungan antar variabel baik yang bersifat <i>univariate</i> maupun <i>multivariate</i>, Memahami konsep analisis variansi sebagai dasar pembuatan suatu rancangan eksperimen serta memahami dan mampu menerapkan beberapa teknik dalam analisa data kategorial.</p> <p><i>The course is designed to provide students with an understanding and ability to use one of decision making methods using inferential statistics, including parametric hypothesis testing and non parametric. By the end of the course, students are expected to be able to build inter-variables relationship models both univariate and multivariate, to understand variance analysis concept as a foundation to build experiments design, and to be able to implement categorical data analysis techniques.</i></p>
<p>KOMPETENSI/COMPETENCY</p>	<ul style="list-style-type: none"> • Keterampilan memecahkan masalah • Keterampilan memanfaatkan teknologi informasi • Keterampilan analisis • <i>Problem solving skills</i> • <i>Proficiency in ICT</i> • <i>Analytical skills</i>
<p>POKOK BAHASAN/SUBJECTS</p>	<ul style="list-style-type: none"> • Uji Hipotesa, meliputi : Uji Satu Arah dan Dua Arah • Statistik Non-Parametrik dan Penerapan Uji Chi-Square dalam Analisa Data Kategori • Analisa Regresi, meliputi Model Regresi dan Metode Estimasi Parameter dalam Model Regresi • Analisis Variansi (ANOVA), meliputi : One Way ANOVA dan Two Way ANOVA

**PUSTAKA
UTAMA/REFERENCES**

- Multivariate Analysis, meliputi : Analisa Faktor, Analisa Kluster, Analisa Diskriminan dan Analisa Komponen Utama
 - *Hypothesis tests: one way test and two way tests*
 - *Non parametric statistics and Chi-Square and categorial data analysis implementation*
 - *Regression analysis; it includes Regression Model and Parameter Estimation Method in Regression Model*
 - *Analysis of Variance (ANOVA) consists of one way ANOVA and two way ANOVA*
 - *Multivariate analysis, including: Factor Analysis, Cluster Analysis, Discriminant Analysis, and Main Component Analysis.*
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- Dillon, William R, Matthew Goldstein, Multivariate Analysis, Canada, John Wiley and Sons, 1984.
 - Iman, Ronald L. & J Conover, Modern Business Statistics, New York, John Wiley and Sons, 1983.
 - Kvanli, Alan H, R.J Pavur, K. B. Keeling, Introduction to Business Statistics 6th ed., Thomson South Western, 2003.
 - Mendenhall, William, Terry Sincich, Statistic for Engineering and the Sciences 4th ed., Prentice Hall International Inc., 1995.
 - Sprent, P., Applied Nonparametric Statistical Methods, Chapman and Hall, 1989.
 - Walpole, R.E, Raymond H. Myers, S.H. Myers, Keying Ye, Probability and Statistics for Engineers and Scientists 7th ed, New Jersey, Prentice Hall Inc., 2002.

**MATA KULIAH/
COURSE
TITLE**

TI091305 : Ergonomi dan Perancangan Sistem Kerja
TI091305 : *Ergonomics and Work Design*
Credits: 3
Semester: III

TUJUAN

Kuliah ini memberikan pemahaman bagi

PEMBELAJARAN/LEARNING OBJECTIVES	<p>mahasiswa aspek-aspek mengenai kemampuan, kelebihan serta keterbatasan manusia untuk berinteraksi dengan sistem kerjanya sehingga dapat merancang sistem kerja yang ergonomis dimana sistem kerja tersebut memungkinkan manusia dapat bekerja secara efektif, nyaman, aman, sehat, dan efisien.</p> <p><i>This course provides students with knowledge about human strengths and limitations in interacting within her/his work system and based on this knowledge, students can design a work system where human is effectively, comfortably, safely, healthy, and efficiently doing their jobs.</i></p>
KOMPETENSI/COMPETENCY	<ul style="list-style-type: none"> • Perancang Sistem • Ketrampilan Sintesis, integrasi, dan perancangan • Ketrampilan Manajerial • <i>System designer</i> • <i>Synthesizing, integrating, and designing skills</i> • <i>Managerial skills</i>
POKOK BAHASAN/SUBJECTS	<ul style="list-style-type: none"> • Pengantar dan definisi ergonomi, latar belakang historis dan pengembangannya. • Peranan manusia sebagai komponen sistem manusia-mesin. • Pengaruh kemampuan dan keterbatasan manusia baik secara fisik maupun dari segi mental psikologis kerja. • Perancangan sistem dan pengembangan metode kerja guna mengefektikan serta mengefisienkan kerja. • Praktikum ergonomi di Laboratorium Ergonomi Industri. • <i>Introduction and definition; historical background and recent development of ergonomics.</i> • <i>Human role as one of human-machine system components.</i> • <i>Human strength and limitations: physically and mentally.</i> • <i>System design and work method development.</i> • <i>Practicum.</i>

**PUSTAKA
UTAMA/REFERENCES**

- Granjean, E. Fitting The Task To The Man : An Ergonomic Approach, London : Taylor & Francis Ltd., 1982.
- McCormick, Ernest J and Sanders, Human Factors In Engineering And Design, New York : McGraw-Hill Book Co., 1992.
- Nurmianto, Ergonomi : Konsep Dasar dan Aplikasinya(Ergonomics : Basic Principles and Applications), Jakarta : Guna Widya, 1996.
- Pulat, Mustafa, Fundamentals of Industrial Ergonomics, New Jersey : Prentice Hall, 1992.
- Wickens, Christopher D.; Gordon, Sallie E.; Liu, Yili, An Introduction to Human Factors Engineering, New York : Addison Wesley Longman, 1998.

**MATA KULIAH/
COURSE
TITLE**

TI091101 : Matematika Optimasi II
TI091101 : Optimization Mathematics II

Credits: 3
Semester: IV

**TUJUAN
PEMBELAJARAN/LEARNING
OBJECTIVES**

Mengenalkan mahasiswa dengan berbagai kelas optimasi dengan pembatas, bisa menyelesaikannya baik dengan manual maupun program komputer sederhana.

To provide students with an understanding of various constrained optimization classes as well as the solving methods which can be applied either manually or using simple computer programs.

KOMPETENSI/COMPETENCY

- Keterampilan memecahkan masalah
- Keterampilan memanfaatkan teknologi informasi
- Keterampilan analisis
- *Problem solving skills*
- *Proficiency in ICT*
- *Analytical skills*

POKOK BAHASAN/SUBJECTS	<ul style="list-style-type: none"> • <i>Direct search and gradient based search</i> • <i>Constrained optimization: Lagrange problem, karush khun tucker condition</i> • <i>Linearization method for constrained problems</i> • <i>Metoda dekomposisi</i> • <i>Interior point method :Primal-Dual Solutions and Central Path, Primal Affine-Scaling Method, Primal Newton Barrier Method, Primal-Dual Interior-Point Methods</i>
PUSTAKA UTAMA/REFERENCES	<ul style="list-style-type: none"> • Reklaitis, Ravindran. <u>Engineering optimization</u>, Wiley and Sons. • Watkins D.S. <u>Fundamental of Matrix computations</u>, John Wiley and Sons. • Venkataraman, <u>Optimizations with Matlab</u>, Wiley and Sons. • Budi Santosa. <u>Matlab untuk statistika dan teknik optimasi</u>, Graha Ilmu.

MATA KULIAH/ COURSE TITLE	<p>TI091306: Penelitian Operasional I TI091306: <i>Operations Research I</i></p> <p>Credits: 3 Semester: IV</p>
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TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES	<p>Mahasiswa mampu memahami konsep dasar dan metode penyelesaian permasalahan persamaan linear, pemrograman linear serta aplikasi-aplikasi program linear dalam permasalahan Transportasi dan Penugasan dan Network Flows Problem.</p> <p><i>To provide students with an understanding of basic concept and linear equation problem solving methods, linear programming (LP), and LP applications especially Transportation, Assignment, and Network Flow Problems.</i></p>
KOMPETENSI/COMPETENCY	<ul style="list-style-type: none"> • Keterampilan memecahkan masalah • Keterampilan memanfaatkan teknologi informasi

	<ul style="list-style-type: none"> • Ketrampilan analisis • <i>Problem solving skills</i> • <i>Proficiency in ICT</i> • <i>Analytical skills</i>
POKOK BAHASAN/SUBJECTS	<ul style="list-style-type: none"> • Pengertian dan operasi dasar vektor • Pengertian dan operasi dasar matriks • Pengantar permodelan yang bersifat deterministik • Metode simplex, dualitas, dan sensitivitas • Permasalahan transportasi, penugasan dan network flow • <i>Vector: an overview and basic operations</i> • <i>Matrix: an overview and basic operations</i> • <i>An introduction to deterministic modeling</i> • <i>Simplex method, duality, and sensitivity</i> • <i>Transportation, Assignment, and Network Flow Problems.</i>
PUSTAKA UTAMA/REFERENCES	<ul style="list-style-type: none"> • Bazaraa, Mokhtar S, <u>Linear Programming and Network Flows 2nd edition</u>, John Wiley & Sons Inc. • Taha, Hamdy A, "Operations Research: An Introduction", Prentice Hall Education, 7th Ed • Hillier, F. S. and G. J. Lieberman, <u>Introduction to Operations Research</u>, McGraw-Hill Science, 2002.

MATA KULIAH/ COURSE TITLE	TI091307 : Teknik Tata Cara dan Pengukuran Kerja TI091307 : <i>Methods Engineering and Work Measurement</i> Credits: 3 Semester: IV
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MATA KULIAH/ COURSE TITLE	TI091308 : Manajemen Proyek TI091308 : <i>Project Management</i> Credits: 2 Semester: IV
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TUJUAN PEMBELAJARAN/LEARNING	Tujuan umum mata kuliah ini adalah membangun kemampuan mahasiswa untuk
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OBJECTIVES	<p>mengaplikasikan metode-metode atau teknik-teknik dalam pengelolaan proyek dalam rangka memenuhi tujuan proyek, yaitu tepat waktu, tepat anggaran, dan pemenuhan ruang lingkup proyek. Mata kuliah ini mendalami segala aspek yang berkaitan dengan proyek mulai dari konsep dasar proyek, perbedaan karakteristiknya dengan pekerjaan atau program dalam suatu perusahaan, serta segala sesuatu mengenai pengelolaan proyek baik aspek teknis maupun manajerial.</p> <p><i>The course aims to build students skills to apply the methods or techniques of managing projects in achieving project's goals, which are: on time delivery, on the right costs, and fulfilling the scope of the projects. This course discusses in depth about various aspects related in a project that include basic concepts of project, project characteristics and the differences in comparison with program in a company, and projects management in terms of technical and managerial aspects.</i></p>
KOMPETENSI/COMPETENCIES	<ul style="list-style-type: none"> • Ketrampilan Sintesis, integrasi, dan perancangan • Ketrampilan Manajerial • Ketrampilan memecahkan masalah • <i>Synthesizing, integrating, and designing skills</i> • <i>Managerial skills</i> • <i>Problem solving skills</i>
POKOK BAHASAN/SUBJECTS	<ul style="list-style-type: none"> • Pengantar manajemen proyek • Organisasi proyek: struktur, budaya, dan <i>stakeholder management</i> • Seleksi proyek, perencanaan proyek, dan penjadwalan proyek • Pengalokasian sumber daya, manajemen resiko, kepemimpinan dan optimisasi proyek. • Pengendalian proyek dan aspek-aspek lain dalam manajemen proyek • <i>Introduction to project management</i> • <i>Project organization: structure, cultures, and stakeholder management</i>

PUSTAKA UTAMA/REFERENCES	<ul style="list-style-type: none"> • <i>Projects selection, project planning and scheduling</i> • <i>Resources allocation, risk management, leadership and project optimization.</i> • <i>Project control and other aspects in project management.</i> <hr/> <ol style="list-style-type: none"> 1. Gray & Larson (2004). Project Management, the Managerial Process, Mc Graw Hill, Boston. 2. Kerzner, H. (2003). Project Management: A systems approach to planning, scheduling, and controlling. Eight Edition, John Wiley & Sons, Inc. 3. Santosa, Budi (1997). Manajemen Proyek, Guna Widya, Edisi 1 cetakan 2.
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MATA KULIAH/ COURSE TITLE	TI091309 : Sistem Manufaktur TI091309 : <i>Manufacturing System</i> Credits: 4 Semester: IV
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TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES	Memberikan kemampuan untuk memahami dan menganalisa sistem manufaktur yang meliputi proses manufaktur, pemindahan material, penyimpanan material, inspeksi, dan packaging serta aktivitas non-fisik yang menunjang operasional manufaktur. <i>The course aims to build students skills to understand and analyze manufacturing system in which includes manufacturing process, material transfer, material storage(warehousing), inspection, packaging and non-physical activities to support manufacturing operations.</i>
KOMPETENSI/COMPETENCY	<ul style="list-style-type: none"> • Ketrampilan Sintesis, integrasi, dan perancangan • Ketrampilan Manajerial • Ketrampilan memecahkan masalah • <i>Synthesizing, integrating, and designing skills</i> • <i>Managerial skills</i> • <i>Problem solving skills</i>

**POKOK
BAHASAN/SUBJECTS**

- Pengantar sistem manufaktur
- Perencanaan sistem manufaktur, desain dalam sistem manufaktur
- Material handling, Inspeksi dan pengepakan, *Automated Data Capture (ADC)*, dan sistem perakitan
- Sel manufaktur stasiun tunggal, Grup teknologi atau *cellular manufacturing*, sistem manufaktur fleksible
- Perencanaan dan pengendalian sistem manufaktur, fungsi bisnis lainnya dalam sistem manufaktur, *manufacturing assesment*, dan konsep-konsep khusus yang meliputi: JIT, *Lean Production*, *Agile*, *Reconfigurable Manufacturing System*, dan *Intelligent manufacturing system*.
- *Introduction to Manufacturing System*
- *Manufacturing system planning, and design in the manufacturing system.*
- *Material handling, inspection and packaging, Automated Data Capture (ADC), and assembly system.*
- *Single station manufacturing cells, Group Technology and/or cellular manufacturing, Flexible Manufacturing System (FMS)*
- *Manufacturing system planning and control, other business function in manufacturing system, manufacturing assessment, Special concepts: Just In Time, Lean Production, Agile, Reconfigurable Manufacturing System, and Intelligent Manufacturing System.*

**PUSTAKA
UTAMA/REFERENCES**

1. Groover, M.P 2001, Automation, Production Systems, and Computer Integrated Manufacturing, Prentice Hall
2. Boothroyd, G 1992, Assembly Automation and Product Design, Marcel Dekker Inc., New York
3. Lotter, B 1989, Manufacturing Assembly Handbook, Butterworths

**MATA KULIAH/
COURSE**

**TI091310 : Penelitian Operasional II
TI091310: Operations Research II**

TITLE

Credits: 4
Semester: V

TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES	<p>Memahami dan mampu membuat model dari sistem yang bersifat probabilistik/stokastik dan teknik-teknik penyelesaiannya baik secara algoritmik (manual) maupun dengan bantuan software komputer.</p> <p><i>To deliver an understanding and ability to build models of probabilistic/stochastic system and to use appropriate solving techniques both manually and computationally.</i></p>
KOMPETENSI/COMPETENCY	<ul style="list-style-type: none"> • Keterampilan memecahkan masalah • Keterampilan memanfaatkan teknologi informasi • Perancang sistem • <i>Problem solving skills</i> • <i>Proficiency in ICT</i> • <i>System designer</i>
POKOK BAHASAN/SUBJECTS	<ul style="list-style-type: none"> • Program Integer • Goal Programming • Proses dan rantai markov • Teori dan model antrian • Pengantar simulasi (Monte carlo) dan Teori permainan • <i>Integer Programming</i> • <i>Goal Programming</i> • <i>Markov chain and the process</i> • <i>Queuing theory and queuing model</i> • <i>Introduction to simulation (Monte Carlo) and Game theory</i>
PUSTAKA UTAMA/REFERENCES	<ul style="list-style-type: none"> • Winston, Wayne, L. <u>Operations Research: Applications and Algorithms 4th Ed</u>, Thomson Learning, Inc., 2004 • Taha, Hamdy A, <u>Operations Research: An Introduction 7th Ed</u>, Prentice Hall Education, 2003. • Hillier, F. S. and G. J. Lieberman, <u>Introduction to Operations Research</u>, McGraw-Hill, 2002. • Ravindran, dan Philips, Don T., <u>Operation Research: Principles and Practice</u>, John Wiley, 2000.

MATA KULIAH/ COURSE TITLE	TI091311 : Ekonomi Teknik TI091311 : <i>Engineering Economics</i> Credits: 3 Semester: V
TUJUAN PEMBELAJAR AN/ LEARNING OBJECTIVES	Mampu melakukan evaluasi kelayakan dari beberapa proposal teknik dalam kaitannya dengan dimensi nilai (<i>worth</i>) dan biaya (<i>cost</i>), serta mampu membuat suatu keputusan ekonomik dan memahami resiko/dampak ekonomik dari suatu permasalahan aplikasi teknik (<i>engineering application</i>) di suatu industri. <i>To evaluate the feasibility of several engineering proposals in relation to their dimension of worth and cost, and have capability to make economic decisions and understand the economic impacts of an implementation of any engineering applications in an industry.</i>
KOMPETENSI/ COMPETENC ES	<ul style="list-style-type: none"> • Ketrampilan Sintesis, integrasi, dan perancangan • Ketrampilan Manajerial • Ketrampilan memecahkan masalah <ul style="list-style-type: none"> • <i>Synthesizing, integrating, and designing skills</i> • <i>Managerial skills</i> • <i>Problem solving skills</i>
POKOK BAHASAN/ SUBJECTS	<ul style="list-style-type: none"> • Konsep ekonomi dan biaya. • Ekuivalensi Ekonomi. • Metode-metode untuk melakukan perbandingan alternatif: Nilai Sekarang, Nilai Mendatang, Nilai Seragam, Rate of Return, Analisis Manfaat dan Biaya • Analisis Penggantian. • Analisis Ekonomik yang terkait dengan faktor depresiasi, pajak, resiko, serta kondisi ketidakpastian. <ul style="list-style-type: none"> • <i>Concept of economics and cost.</i> • <i>Economic equivalent.</i> • <i>Methods to compare investment alternatives: Present Value, Future Value, Annual Value, Rate of Return, and Benefit Cost Analysis.</i> • <i>Replacement analysis</i> • <i>Any economic analysis, which is related to depreciation, tax, risk, and uncertainty.</i>
PUSTAKA UTAMA/REFER	Thuesen,G.J.; Fabrycky,W.J. (2002), <i>Engineering Economy</i> , 9 th Edition, Prentice Hall Inc.,New Jersey.

ENCES

MATA KULIAH/
COURSE
TITLE

**TI091312 : Perencanaan dan Pengendalian
Produksi**
TI091312 : *Production Planning and Control*
Credits: 4
Semester: V

TUJUAN
PEMBELAJAR
AN/LEARNING
OBJECTIVES

Perencanaan dan pengendalian produksi terkait dengan keseluruhan proses perencanaan dan pengendalian produksi untuk memenuhi kebutuhan pelanggan dengan sumber daya yang tersedia. Aktivitas yang tercakup di dalamnya meliputi peramalan permintaan, pembuatan rencana produksi, perencanaan kebutuhan material dan kapasitas, penjadwalan sumber daya produksi, dan pengendalian aktivitas di rantai produksi. Tujuan mata kuliah ini adalah untuk memperkenalkan ke mahasiswa berbagai konsep, teknik, metode, maupun isu-isu praktis untuk melakukan perencanaan dan pengendalian produksi.

This course is mainly about the whole process of production planning and control to meet the demand using available resources. It includes demand forecasting, production planning, material requirements planning and capacities, and production control activities. The aim is to provide students with various concepts, techniques, methods, and practical issues related to the production planning and control.

KOMPETENSI/
COMPETENCY

- Keterampilan sintesis, integrasi, dan perancangan
- Keterampilan manajerial
- Keterampilan memecahkan masalah
- *Synthesizing, integrating, and designing skills*
- *Problem solving skills*
- *Managerial skills*

POKOK
BAHASAN/SU
BJECTS

- Pengantar tentang sistem produksi dan konteks PPC.
- Peramalan permintaan, perencanaan produksi aggregate, pengelolaan persediaan, jadwal induk produksi
- Perencanaan kebutuhan bahan, perencanaan kapasitas, pengendalian aktivitas produksi
- Beberapa teknik lain (JIT, TOC)
- Sistem informasi: Pengenalan ERP, Pengenalan CPFR dalam konteks SCM

	<ul style="list-style-type: none"> • <i>Introduction to production system and PPC context</i> • <i>Demand forecasting, aggregate planning, inventory planning, master production schedule</i> • <i>Material requirements planning, capacity planning, production activity control</i> • <i>Other techniques: Just in Time, TOC</i> • <i>The use of information system: Introduction to ERP and CPFR in supply chain context</i>
PUSTAKA UTAMA/REFERENES	<ul style="list-style-type: none"> • Fogarty, D. W., Blackstone, J. H., and Hoffmann, T. R. (1991). <i>Production and Inventory Management</i> 2nd Ed., South Western Publishing. • Vollmann, T., Berry, W., Whybark, C., and Jacobs, R. (2005). <i>Manufacturing Planning and Control Systems for Supply Chain Management</i> Fifth Ed., McGraw-Hill. • Nahmias, S. (2000). <i>Production and Operations Analysis</i>, 4th Ed., McGraw-Hill/Irwin

MATA KULIAH/COURSE TITLE	TI091313 : Perancangan Fasilitas TI091313 : <i>Facilities Planning</i> Credits: 3 Semester: V
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TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES	<p>Memahami konsep dasar, proses dan teknik-teknik perencanaan fasilitas serta mampu merancang dan mengevaluasi tata letak fasilitas suatu sistem manufaktur / jasa yang terdiri dari mesin, tempat kerja, work-in-process inventory, gudang, serta sistem pemindahan materialnya.</p> <p><i>The course provides students with understanding of facilities planning basic concepts, process, and techniques in purpose to design and evaluate facilities layout of manufacturing/services system in which includes machines, work stations, work in process inventory, warehouse, and material handling system.</i></p>
KOMPETENSI/COMPETENCIES	<ul style="list-style-type: none"> • Perancang sistem • Keterampilan memecahkan masalah • Keterampilan sintesis, integrasi, dan perancangan • <i>System designer</i>

	<ul style="list-style-type: none"> • <i>Problem solving skills</i> • <i>Synthesizing, integrating, and designing skills</i>
<p>POKOK BAHASAN/SUBJECTS</p>	<ul style="list-style-type: none"> • Pengantar perencanaan fasilitas dan analisa lokasi fasilitas. • Analisis produk dan proses, aliran material dan kebutuhan ruang, sistem fasilitas, dan <i>personal requirements</i>. • Pendekatan tradisional, model-model matematik, dan algoritma dasar untuk layout fasilitas. • <i>Computer aided layout design, material handling, gudang dan penyimpanan.</i> • <i>Group Technology</i> dan layout untuk kebutuhan khusus. • <i>Introduction to facilities planning and analysis of facilities location.</i> • <i>Analysis of products and processes, material handling and space requirements, facilities system, and personal requirements.</i> • <i>Conventional approaches, mathematical models, and basic algorithm for layout planning.</i> • <i>Computer aided layout design, material handling, storage and warehousing.</i> • <i>Group Technology and layout for special purpose.</i>
<p>PUSTAKA UTAMA/REFERENCES</p>	<ol style="list-style-type: none"> 1. Heragu, Sunderesh (1997). <i>Facilities Design</i>, PWS Publishing Company 2. Tompkins, James A; White, John A; Bozer, Yavuz A (2003). <i>Facilities Planning</i>, 3rd edition, John Wiley & Sons 3. Richard L Francis, Leon F McGinnis, and John A White (1992). <i>Facility Layout and Location, An Analytical Approach</i>, 2nd edition, Prentice Hall 4. Meyers, Fred E and Stephens, Matthew P (2005). <i>Manufacturing Facilities Design and Material Handling</i>, 3rd edition 5. Apple, James A (1977). <i>Plant Layout and Material Handling Systems Design</i>, John Wiley & Sons 6. Wignjosoebroto, Sritomo (2003). <i>Tata Letak Pabrik dan Pemindahan Bahan</i>, Guna Widya, Surabaya

**MATA KULIAH/
COURSE
TITLE**

**TI091314 : Perancangan dan Pengembangan
Produk
TI091314 : *Products Design and Development***
Credits: 3
Semester: V

**TUJUAN
PEMBELAJARAN/LEARNING
OBJECTIVES**

Perancangan dan pengembangan produk merupakan bagian dari strategi bisnis-industri yang didalamnya mencakup langkah-langkah perencanaan produk mulai dari pengembangan ide/ gagasan tentang fungsi produk (berdasarkan persepsi kebutuhan pasar ataupun inovasi teknologi), perancangan produk (engineering & industrial design), pembuatan prototipe, test & evaluasi dan berlanjut dengan aktivitas produksi serta penjualan (distribusi) produk. Tujuan mata kuliah ini adalah untuk membekali mahasiswa dengan kemampuan merancang suatu produk sebagai bagian dari strategi bisnis-industri secara keseluruhan.

Product design and development is a part of business strategy in which includes product planning: from idea generation of product function either based on market requirements or innovation, product design (engineering and industrial design), prototyping, testing and evaluation, continued by production and marketing or distribution. The course aims to build students skills in designing products as a part of industrial strategy as a whole.

KOMPETENSI/COMPETENCY

- Perancang sistem
- Keterampilan sintesis, integrasi, dan perancangan
- Ketrampilan manajerial
- *System designer*
- *Problem solving skills*
- *Synthesizing, integrating, and designing skills*

- Definisi & Pengertian Produk
- Pengertian produk industri dan perancangan produk baru
- Fase 0 : Perencanaan produk [Latar

<p>POKOK BAHASAN/</p> <p>SUBJECTS</p>	<p>Belakang/ business landscape dan tantangannya, Strategi Pengembangan]</p> <ul style="list-style-type: none"> • Fase 1 : Pengembangan konsep [analisa pasar/ identifikasi peluang, identifikasi Voice of Customer, Consumer Preference Measurement/ QFD, spesifikasi target dan konsep teknis, seleksi konsep, dan analisa financial] • Fase 2 : Perancangan tingkatan sistem [Arsitektur desain, kansei engineering] • Fase 3 : Perancangan detail [Design for Manufacturing, Design for Assembly, Design for Environmental, Design for X] • Fase 4 : Pengujian dan perbaikan [prototyping] • Fase 5 : Peluncuran produk <ul style="list-style-type: none"> • <i>Product definition, industrial products and new product design</i> • <i>Phase 0: Product planning, includes background, business landscape and its challenges</i> • <i>Phase 1: concept development (market analysis/ opportunity identification, Voice of Customer identification, consumer preference measurement/QFD, technical concept and target specification, concept selection, and financial analysis)</i> • <i>Phase 2: System level design (architecture design, Kansei engineering)</i> • <i>Phase 3: Detail design (design for manufacturing, design for assembly, design for environmental)</i> • <i>Phase 4: Testing and evaluation (prototyping)</i> • <i>Phase 5: Product launching</i>
<p>PUSTAKA UTAMA/REFERENCES</p>	<ul style="list-style-type: none"> • Cross, Nigel. Engineering Design Methods: Strategies for Product Design. New York; John Wiley & Sons, 1996. • Roozenburg, NFM and J. Eekels. Product Design: Fundamentals and Methods. Chicester: John Wiley & Sons, 1995. • Urban, Glen L. and John R. Hauser. Design and Marketing of New Products. Englewood Cliffs, NJ : Prentice-Hall Inc., 1993. • Wright, Ian. Design Methods in Engineering and Product Design.

London: McGraw-Hill Co., 1998.

- Loch, C. and Kavadias, S. (2008) Handbook of New Product Development Management. Elsevier
 - Annacchino, M. (2003) New Product Development From Initial Idea to Product Management. Elsevier. ISBN : 0750677325

**MATA KULIAH/
COURSE
TITLE**

TI091211 : Manajemen Organisasi dan SDM
TI091211 : *Organization & Human Resource Management*

Credits: 4

Semester: VI

TUJUAN PEMBELAJARAN/

LEARNING OBJECTIVES

Manajemen organisasi dan sumber daya manusia (MOSDM) merupakan mata kuliah yang mengupas segala sesuatu yang harus dilakukan jika muncul kebutuhan berdirinya suatu organisasi industri, bagaimana bentuk organisasi yang sesuai untuk kebutuhan dan kondisi lingkungan tertentu, sekaligus bagaimana cara mengelola organisasi industri tersebut agar mampu bertahan, dan terus berkembang menghadapi dinamika lingkungan eksternal yang terus-menerus berubah. Tujuan mata kuliah ini adalah mahasiswa mampu mengembangkan kemampuan merancang suatu organisasi yang sesuai dengan kebutuhan dan kondisi lingkungan, serta merancang suatu sistem manajemen sumber daya manusia (SDM) yang sesuai untuk organisasi tersebut.

The course discusses in depth about things need to be done establishing an industrial organization, including what is the best suitable form of organization for specific need and certain environment condition, as well as how to manage industrial organization in order to survive, and keep growing in facing external environment dynamics that changes over time. It aims to build students skills of designing an appropriate organization for a specific need and to design the best suitable human resource management system for that organization.

<p>KOMPETENSI/COMPETENCIES</p>	<ul style="list-style-type: none"> • Perancang sistem • Keterampilan manajerial • Keterampilan memecahkan masalah • Keterampilan sintesis, integrasi, dan perancangan • <i>System designer</i> • <i>Managerial skills</i> • <i>Problem solving skills</i> • <i>Synthesizing, integrating, and designing skills</i>
<p>POKOK BAHASAN/SUBJECTS</p>	<ul style="list-style-type: none"> • Hubungan antara kebutuhan/strategi organisasi dengan bentuk organisasi dan strategi manajemen sumber daya manusia (MSDM). • Pengantar manajemen organisasi, desain struktur organisasi, mengelola budaya organisasi, dan pengembangan organisasi. • Manajemen sumber daya manusia strategis, analisa jabatan, perencanaan dan perekrutan SDM, seleksi SDM, dan pengembangan SDM. • Penilaian kinerja, kompensasi, dan manajemen SDM berbasis kompetensi. • Hubungan industri, manajemen perubahan, manajemen konflik, dan manajemen SDM global. • <i>Alignment between organization needs/strategy with organization form and human resource management strategy.</i> • <i>Introduction to organization management, organization structure design, managing organization cultures, and organization growth.</i> • <i>Strategic human resource management (HRM), job analysis, human resource planning and recruitment, human resource selection and developments.</i> • <i>Performance appraisal, compensation (wages, incentives, benefits and services), and competence based HRM.</i> • <i>Industrial relations, organization renewal, conflict management, and global HRM.</i>
<p>PUSTAKA UTAMA/REFERENCES</p>	<ol style="list-style-type: none"> 1. Dessler, Gary. Human Resource Management, 10th ed. Pearson Prentice

Hall: 2005
2. Jones, Gareth R. **Organizational Theory, design, and Change**, 4th ed. Prentice Hall: 2004

MATA KULIAH/ COURSE TITLE	TI091315 : Permodelan Sistem TI091315 :System Modeling Credits: 2 Semester: VI
TUJUAN PEMBELAJAR AN/LEARNING OBJECTIVES	<p>Memahami suatu pendekatan untuk memecahkan permasalahan nyata mulai dari tahap identifikasi dan pendefinisian masalah, pendekatan sistem untuk pemecahan masalah, proses pemodelan, pemilihan model, perancangan/pengembangan model, teknik solusi, sampai dengan analisis model.</p> <p><i>To understand approaching methods of real problem solving started from identification stage and problem definition, system approach method, modeling process, model selection, model design and development, solution techniques, to the model analysis.</i></p>
KOMPETENSI/ COMPETENCI ES	<ul style="list-style-type: none">• Perancang sistem• Keterampilan sintesis, integrasi, dan perancangan• Keterampilan memecahkan masalah• <i>System designer</i>• <i>Synthesizing, integrating, and designing skills</i>• <i>Problem solving skills</i>
POKOK BAHASAN/SU BJECTS	<ul style="list-style-type: none">• Sistem dan berpikir system, identifikasi dan pendefinisian masalah• Pendekatan sistem untuk pemecahan masalah• Proses pemodelan dengan pendekatan <i>hard Operations Research, soft Operations Research (Soft System Methodology)</i> dan analisis keputusan.• Pemilihan model dan perancangan/pengembangan model untuk pemecahan masalah• Teknik/pendekatan untuk mendapatkan solusi model dan analisis model• <i>System and system thinking, problem identification and definition</i>• <i>System approach for problem solving</i>• <i>Modeling process using hard operations research approach,</i>

PUSTAKA UTAMA/REFER ENCES	<p><i>soft operations research approach (Soft System Methodology) and decision analysis.</i></p> <ul style="list-style-type: none"> • <i>Model selection, and model design/development for problem solving</i> • <i>Techniques to obtain model solution and model analysis.</i>
	<ol style="list-style-type: none"> 1. Deallenbach, H.G. and McNickle, D.C. (2005), Management Science: Decision making through system thinking, Palgrave Macmillan. 2. Murthy, D.N.P., Page, M.W., and Rodin, E.Y. (1990), Mathematical Modelling, Pergamon Press. 3. Boardman, J. and Sauser, B. (2008), Systems Thinking: Coping with 21th Century Problem, CRC Press. 4. Murthy, D.N.P., Page, M.W., and Rodin, E.Y. (1990), Mathematical Modelling, Pergamon Press.

MATA KULIAH/ COURSE TITLE	<p>TI091316 : Teknik Pengendalian Kualitas TI091316 : Quality Control Techniques</p> <p>Credits: 3 Semester: VI</p>
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TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES	<p>Memahami teknik-teknik yang dapat digunakan untuk mengendalikan mutu produk yang sangat penting untuk merancang sebuah sistem jaminan mutu.</p> <p><i>To deliver an understanding and knowledge of quality control techniques of which very important to design a quality assurance system.</i></p>
KOMPETENSI/COMPETENCIES	<ul style="list-style-type: none"> • Perancang sistem • Keterampilan manajerial • Ketrampilan memecahkan masalah • <i>System designer</i> • <i>Managerial skills</i> • <i>Problem solving skills</i>
POKOK BAHASAN/SUBJECTS	<ul style="list-style-type: none"> • Konsep dasar teknik pengendalian kualitas • Teknik pengendalian, faktor penentu kualitas output produksi dan cara pengendaliannya, aplikasi 7 tools. • <i>Sampling</i>, penggunaan standard dalam proses pengendalian kualitas

	<ul style="list-style-type: none"> • Aplikasi peta kontrol: <i>attributes dan variables control charts</i> • Sistem jaminan kualitas: dokumentasi sistem mutu, sistem manajemen mutu standard, ISO 9000, Malcolm Baldrige, <i>Six Sigma</i> • <i>The basic concepts of quality control techniques</i> • <i>Control techniques, production output quality influencing factors and control methods, 7 tools applications.</i> • <i>Sampling, standard uses in quality control process.</i> • <i>Control chart applications: attributes and variables control charts</i> • <i>Quality assurance system: quality sistem documentation, standard quality management system, ISO 9000, Malcolm Baldrige, Six Sigma</i>
<p>PUSTAKA UTAMA/REFERENCES</p>	<ol style="list-style-type: none"> 5. Montgomery, Douglas C. (2005), <i>Introduction to Statistical Quality Control.</i> New York: John Wiley & Sons Corp. 6. Grant, E.L. and R.S. Leavenworth (2000). <i>Statistical Quality Control.</i> New York: McGraw-Hill Book, Co. 7. Gitlow, Howards S. (1995), Total Quality Control. Tools and Methods for Improvement, Irwin Co. Publishing Company.

<p>MATA KULIAH/ COURSE TITLE</p>	<p>TI091317: Simulasi Sistem Industri TI091317: <i>Industrial System Simulation</i></p> <p>Credits: 3 Semester: VI</p>
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<p>TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES</p>	<p>Memahami konsep simulasi, permodelan, input & output simulasi, serta membandingkan alternatif system. Mengembangkan kemampuan mahasiswa untuk membuat model simulasi dengan perangkat lunak simulasi (ARENA) serta menganalisis & membandingkan alternatif model.</p> <p><i>To provide students with an understanding of concepts of simulation, modeling, input and</i></p>
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	<p><i>output analysis as well as concept of comparing system alternatives. It aims to develop students' ability to build simulation models with ARENA software, to analyze the results, and to compare alternatives.</i></p>
KOMPETENSI/COMPETENCIES	<ul style="list-style-type: none"> • Keterampilan memecahkan masalah • Keterampilan memanfaatkan teknologi informasi • Ketrampilan analisis • <i>Problem solving skills</i> • <i>Proficiency in ICT</i> • <i>Analytical skills</i>
POKOK BAHASAN/SUBJECTS	<ul style="list-style-type: none"> • Pengantar simulasi: dinamika sistem, simulasi sistem • Dasar-dasar simulasi: tipe-tipe simulasi, perilaku acak, pembangkitan bilangan random. • Simulasi diskrit: tahapan dan analisa input, model konseptual, model simulasi, verifikasi and validasi, analisa output. • Membandingkan sistem • <i>Introduction to simulation: system dynamics, simulation system</i> • <i>Basic Simulation: types of simulation, random behavior, random number generation.</i> • <i>Discrete simulation: stages and input analysis, conceptual model, simulation model, verification and validation, output analysis.</i> • <i>Comparing systems</i>
PUSTAKA UTAMA/REFERENCES	<ul style="list-style-type: none"> • Harrel, Ghosh, Bowden (2004), <u>Simulation using Promodel</u>, McGraw Hill. • Kelton, David W, Randall P Sadoswski, and David T Sturrock, <u>Simulation with Arena</u>, McGraw Hill. • Birta, Louis G, Arbez (2007), <u>Modelling and Simulation</u>, Springer – Verlag London. • Seldon, M Ross (2006), <u>Simulation</u>, Elsevier

MATA KULIAH/ TI091318 : Manajemen Logistik

**COURSE
TITLE**

TI091318 :Logistics Management

Credits: 3

Semester: VI

**TUJUAN
PEMBELAJAR
AN/LEARNING
OBJECTIVES**

Tujuan mata kuliah ini adalah untuk memberikan pengetahuan dan ketrampilan bagi mahasiswa untuk memahami konsep-konsep maupun model-model dalam manajemen logistik serta aplikasinya di dalam kasus nyata. Mahasiswa juga dibekali untuk trampil menggunakan aplikasi perangkat lunak bagi setiap materi perkuliahan yang membutuhkan. Dengan kombinasi antara kemampuan memahami problem-problem logistik, menterjemahkannya dalam model serta metoda penyelesaiannya, diharapkan mahasiswa mempunyai pengetahuan komprehensif tentang manajemen logistik.

The course aims to provide students with understanding on basic concepts and logistics management models and their applications in real case. It also provides required software application for several topics. With the combination of skills of understanding logistics problems, modeling and solving the problems, students are expected to hold a comprehensive understanding about logistics management.

**KOMPETENSI/
COMPETENCY**

- Keterampilan memecahkan masalah
 - Keterampilan sintesis, integrasi, dan perancangan
 - Keterampilan manajerial
 - Keterampilan memanfaatkan teknologi informasi

 - *Problem solving skills*
 - *Synthesizing, integrating, and designing skills*
 - *Managerial skills*
 - *Proficiency in ICT*
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POKOK BAHASAN/SU BJECTS	<ul style="list-style-type: none"> • Pengantar Manajemen Logistik, strategi Logistik, karakteristik produk, Customer Service dalam logistik • Pengolahan pesanan dan Sistem Informasi Logistik, dasar-dasar perencanaan jaringan distribusi, keputusan-keputusan Lokasi Fasilitas dalam Jaringan Distribusi, dasar-dasar perencanaan transportasi logistik • Sistem Pergudangan dan Pemindahan Produk dalam Gudang, outsourcing dalam Jasa Logistik / Third Party Logistics (3PL) • Topik Kontemporer Dalam Logistik II : - Reverse Logistics • Kuliah Tamu oleh Praktisi - Akademisi Logistik / Plant Visit (Industri di Surabaya dan Sekitarnya) • <i>Introduction to Logistics Management, logistics strategy, product characteristics, customer service in logistics.</i> • <i>Order fulfillment and logistics information system, distribution network planning, decisions on facilities location in a distribution network, logistics transportation planning</i> • <i>Warehousing system and replenishment, outsourcing in logistics services (third party logistics/3PL)</i> • <i>Contemporary topic in Logistics II: Reverse Logistics</i> • <i>Guest Lecture and plant visit</i>
PUSTAKA UTAMA/REFER ENCES	<ol style="list-style-type: none"> 1. Ghiani, Gianpaolo. (2004). <u>Introduction to Logistics Systems Planning and Control</u>. California: John Wiley and Sons, Ltd. 2. Ballou, Ronald. H. (2004) <u>Business Logistics Management</u>, Prentice Hall International, Inc., USA 3. Chopra, Sunil (2004). <u>Supply chain Management : Strategy, Planning, and Operation</u>. Prentice Hall International, Inc., New Jersey 4. Fleischmand et.al. (2003) <u>Quantitative Modelling in Reverse Logistics</u>, Springer.

MATA KULIAH/ COURSE TITLE	TI091319 : Perancangan Sistem Industri TI091319 :Industrial System Design Credits: 3 Semester: VI
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TUJUAN PEMBELAJAR AN/LEARNING OBJECTIVES	Mata kuliah ini bertujuan untuk memberikan mahasiswa kemampuan dalam merancang dan menganalisa rencana usaha secara terintegrasi menggunakan semua pengetahuan yang telah diajarkan dalam mata kuliah pada semester-semester sebelumnya. Dalam kuliah ini juga membahas secara mendalam mengenai bagaimana melakukan identifikasi peluang usaha,
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	<p>perancangan produk dan proses, pemilihan lokasi pabrik, perancangan stasiun kerja, perancangan tata letak pabrik, dan perancangan PPC.</p> <p><i>The course aims to build students skills in designing and analyzing an integrated business plan using all related knowledge given in the previous semesters during the study. Also discussed in depth in this course are: how to identify business opportunity, process and product design, plant location selection, work station design, facilities design, and production planning and control.</i></p>
KOMPETENSI/ COMPETENCY	<ul style="list-style-type: none"> • Perancang sistem • Keterampilan sintesis, integrasi, dan perancangan • Keterampilan manajerial <ul style="list-style-type: none"> • <i>System designer</i> • <i>Synthesizing, integrating, and designing skills</i> • <i>Managerial skills</i>
POKOK BAHASAN/ SUBJECTS	<ul style="list-style-type: none"> • Pendahuluan: konsep analisis dan perancangan usaha • Identifikasi peluang, perkiraan kebutuhan masa datang, sizing pabrik • Perancangan produk/jasa, proses dan kebutuhan mesin • Perancangan stasiun kerja, layout dan penentuan lokasi pabrik • Perancangan sistem PPC <ul style="list-style-type: none"> • <i>Introduction: analysis concepts and business plan</i> • <i>Opportunity identification, future demand forecasting, plant sizing</i> • <i>Designing products/services, process and machines requirements</i> • <i>Design of work station, layout and plant location selection</i> • <i>Design of production planning and control system (PPC)</i>
PUSTAKA UTAMA/ REFERENCES	<p>Behrens, W, P.M.Hawraner; <i>Manual for the Preparation of Industrial Feasibility Studies</i>; UNIDO-United Nation Publication, 1992.</p>
MATA KULIAH/ COURSE TITLE	<p>TI09XXXX : Metodologi Penelitian TI09XXXX : Research Methodology Credits: 0 Semester: VI</p>
TUJUAN PEMBELAJAR	<p>Mata kuliah ini bertujuan untuk membekali mahasiswa Teknik</p>

AN/LEARNING OBJECTIVES	<p>Industri dengan pengetahuan (<i>knowledge</i>), ketrampilan (<i>skill</i>), dan sikap ilmiah (<i>attitude</i>) berkaitan dengan komunikasi ilmiah secara lisan dan tertulis. Secara khusus, mata kuliah ini akan membekali mahasiswa Teknik Industri dengan metode - metode menggali dan menyarikan informasi, melakukan penyuntingan dan menulis referensi, melakukan komunikasi ilmiah baik secara lisan dan tertulis, ketrampilan melakukan riset, dan menulis laporan dan jurnal ilmiah. Dengan memahami hakekat riset dan penulisan ilmiah, seorang sarjana Teknik Industri diharapkan juga dapat menjadi <i>knowledgeable consumer</i> dari produk – produk karya ilmiah yang ada.</p> <p><i>This course is designed to provide students with knowledge, skills, and scientific attitude of which related to scientific communication both oral and written. In specific, this course provides students with methods of searching related information, quotation and referencing methods, communicating both orally and written, skills of conducting research, and how to write scientific report or journal. By understanding research methods and scientific reporting in depth, students are expected to be knowledgeable consumers of scientific products in the future.</i></p>
KOMPETENSI/COMPETENCY	<ul style="list-style-type: none"> • Intrapersonal dan <i>communication skills</i> • Ketrampilan memanfaatkan teknologi informasi • Penguasaan bahasa Inggris dan/atau bahasa asing lainnya • <i>Intrapersonal and communication skills</i> • <i>Proficiency in ICT</i> • <i>Proficiency in English and or other language</i>
POKOK BAHASAN/SUBJECTS	<ul style="list-style-type: none"> • <i>Basic learning skills & Learn how to learn</i>, hakekat dan konsep – konsep penelitian • Manajemen penelitian, metode memunculkan ide penelitian, metode pemilihan topik penelitian, <i>literature search, literature review</i> • <i>Critical thinking & critical review, academic writing skills, penulisan referensi & manajemen literatur, penyusunan desain riset</i> • Penggunaan komputer dan software penunjang penelitian • Penulisan laporan ilmiah dan presentasi ilmiah • <i>Basic learning skills and learn how to learn, the concepts of research</i> • <i>Research management, methods of generating research idea, methods of selecting research topics, literature search, and literature review.</i> • <i>Critical thinking and critical review, academic writing skills, referencing methods and literature management, research design building.</i>

	<ul style="list-style-type: none"> • <i>The use of computer software to support the research</i> • <i>Scientific reporting and presentation.</i>
PUSTAKA UTAMA/ REFERENCES	<ol style="list-style-type: none"> 1. Hussey, J. and Hussey, R. (1997) <i>Business Research: A Practical Guide for Undergraduate and Postgraduate Students</i>, Macmillan Business, London. 2. Cooper, D. R. and Schindler, P. S. (2003), <i>Business Research Methods</i>, McGraw Hill, Singapore. 3. Sekaran, U. (2003) <i>Research Methods for Business: A Skill Building Approach</i>, John Wiley & Sons, USA.
MATA KULIAH/ COURSE TITLE	<p>TI091320 : Pemeliharaan dan Teknik Keandalan TI091320 :Maintenance and Reliability Techniques Credits: 3 Semester: VII</p>
MATA KULIAH/ COURSE TITLE	<p>TI091321 : Perancangan Sistem Informasi Bisnis TI091321 :Information System Design for Business Credits: 3 Semester: VII</p>
MATA KULIAH/ COURSE TITLE	<p>TI091322 : Analisis dan Perancangan Usaha TI091322 :Business Design and Analysis Credits: 3 Semester: VII</p>
TUJUAN PEMBELAJAR AN/LEARNING OBJECTIVES	<p>Analisis dan perancangan usaha adalah mata kuliah lanjutan dari Perencanaan Sistem Industri yang mengintegrasikan mata kuliah lain yang telah diajarkan sebelumnya. Dalam mata kuliah ini, secara kelompok dan dengan supervisi dosen, mahasiswa melanjutkan perancangan yang telah dilakukan dalam Perencanaan Sistem Industri dengan melakukan perancangan supply chain, perancangan pengendalian kualitas dan biaya, perancangan organisasi, analisis keuangan, dan analisis risiko.</p>

	<p><i>This course is an extension of Industrial System Design that integrates most of courses given in the first, second, and third year. In this course, students continue design activities in Industrial System Design class with additional planning include supply chain design, quality and cost design and control, organization design, financial analysis, and risk analysis.</i></p>
KOMPETENSI/ COMPETENCY	<ul style="list-style-type: none"> • Perancang sistem • Keterampilan sintesis, integrasi, dan perancangan • Keterampilan manajerial • <i>System designer</i> • <i>Synthesizing, integrating, and designing skills</i> • <i>Managerial skills</i>
POKOK BAHASAN/SU BJECTS	<ul style="list-style-type: none"> • Perancangan sistem: identifikasi peluang usaha, rancangan produk, rancangan proses, rancangan sistem produksi dan pengoperasiannya, rancangan strategi • Analisa kelayakan: aspek keuangan, sosial/lingkungan, dan resiko • <i>Designing system: business opportunity identification, product design, process design, production system and operations design, design of strategy.</i> • <i>Feasibility study in financial, social/environmental, and risk aspects.</i>
PUSTAKA UTAMA/ REFERENCES	<p>Behrens, W, P.M.Hawraner; <i>Manual for the Preparation of Industrial Feasibility Studies</i>; UNIDO-United Nation Publication, 1992.</p>

MATA KULIAH/ COURSE TITLE	<p>TI091323 : Kerja Praktek TI091323 :Internship Credits: 2 Semester: VIII</p>
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TUJUAN PEMBELAJAR AN/ LEARNING	<p>Kerja praktek adalah mata kuliah kerja lapangan yang dilaksanakan di suatu industri dimana mahasiswa bekerja bersama-sama dengan karyawan lain, supervisor, dan manager, mempraktekkan atau menirukan atau mengikuti kegiatan-kegiatan yang lazimnya dilakukan oleh seorang sarjana teknik industri. Tujuan dari mata kuliah ini adalah agar mahasiswa dapat memahami proses bisnis industri secara utuh, pekerjaan yang terkait dengan bidang teknik industri, serta memberikan <u>pengalaman akan dunia kerja yang akan sangat berguna sebagai</u></p>
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OBJECTIVES	<p>bekal bagi seorang sarjana teknik industri.</p> <p><i>Internship is a field course in which students work together with employees, supervisors, and managers of a certain industry; practicing, following, and experiencing regular activities of an industrial engineer in an industry. The course aims to give students an overview of a thorough industrial business, the works related to the field of industrial engineering, as well as to give a real work experience that is very useful for an industrial engineer graduate.</i></p>
KOMPETENSI/ COMPETENCY	<ul style="list-style-type: none"> • Kemampuan managerial • Kemampuan memecahkan masalah • Intrapersonal dan kemampuan berkomunikasi • <i>Managerial skills</i> • <i>Problem solving skills</i> • <i>Intrapersonal and communication skills</i>
POKOK BAHASAN/ SUBJECTS	<ul style="list-style-type: none"> • Kerja industri • Deskripsi industri dan produknya • Proses manajemen dan proses produksi • Laporan kerja praktek dan presentasi • <i>Industrial work</i> • <i>Industrial description and the products</i> • <i>Management and production process</i> • <i>Internship report and presentation</i>
PUSTAKA UTAMA/ REFERENCES	N/A
MATA KULIAH/ COURSE TITLE	<p>TI091324 : Tugas Akhir</p> <p>TI091324 : <i>Final Project</i></p> <p>Credits: 5</p> <p>Semester: VIII</p>

MATA KULIAH PILIHAN

MATA KULIAH/ COURSE	TI091416: Metoda Metaheuristik TI091416: <i>Metaheuristics</i>
TITLE	Credits: 3 Semester: [VIII]

TUJUAN PEMBELAJARAN/ LEARNING OBJECTIVES	<p>Memberikan pemahaman mengenai pendekatan metaheuristik dalam optimasi dan kegunaannya serta kapan digunakan agar mahasiswa mampu memahami dan mengimplementasikan teknik-teknik metaheuristik dan aplikasinya.</p> <p><i>Todeliver an understanding about metaheuristics approach in optimization, including what and when to use them. It aims to build student's ability to implement metaheuristics techniques and their application.</i></p>
KOMPETENSI/ COMPETENCY	<ul style="list-style-type: none">• Keterampilan memecahkan masalah• Keterampilan memanfaatkan teknologi informasi• Keterampilan analisis <ul style="list-style-type: none">• <i>Problem solving skills</i>• <i>ICT skills</i>• <i>Analytical skills</i>
POKOK BAHASAN/ SUBJECTS	<ul style="list-style-type: none">• Pengantar optimasi• Optimasi klasik: convex, nonconvex functions, Newton, Steepest Descent, Modified Newton• Metaheuristik: Genetic Algorithm, Simulated Annealing, Tabu Search, Ant Colony optimization, Particle swarm optimization, Cross entropy.• <i>Introduction to optimization</i>• <i>Classical heuristics: convex, nonconvex functions, Newton, Steepest Descent, Modified Newton</i>• <i>Metaheuristics: Genetic Algorithm, Simulated Annealing, Tabu Search, Ant Colony optimization, Particle Swarm, Cross Entropy.</i>
PUSTAKA UTAMA/	<ul style="list-style-type: none">• J. Dr'eo A. P'etrowski, P. Siarry E. Taillard, <u>Metaheuristics for Hard Optimization</u>, Springer• <u>Metaheuristics Progress in Complex Systems Optimization</u>, Springer

REFERENCES	<ul style="list-style-type: none"> • Fred Glover, Gary A. Kochenberger, HANDBOOK OF METAHEURISTICS, Kluwer • Santosa B, <i>Matlab untuk statistika dan teknik optimasi</i> (Matlab for statistics and Optimization Techniques, Kota, Graha Ilmu, tahun.
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MATA KULIAH/ COURSE TITLE	<p>TI091418: Pengambilan Keputusan Kriteria Majemuk TI091418: Multi Criteria Decision Making (MCDM) Credits: 3 Semester: [VIII]</p>
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TUJUAN PEMBELAJARAN/ LEARNING OBJECTIVES	<p>Memberikan pemahaman teori dasar mengenai struktur dan kerangka proses pengambilan keputusan Multikriteria Decision Making (MCDM), serta menjelaskan fenomena konfliktual keputusan pada paradigma "<i>bounded rationality</i>" serta penerapannya dalam problematik pengambilan keputusan pada industri dan sistem riil.</p> <p><i>The course provides basic theory about multi criteria decision-making framework. It reviews decision conflict phenomenon in a bounded rationality scheme and its implementation on problematic decision making in industry and real system.</i></p>
KOMPETENSI/ COMPETENCY	<ul style="list-style-type: none"> • Keterampilan memecahkan masalah • Keterampilan memanfaatkan teknologi informasi • Keterampilan analisis • Keterampilan manajerial <ul style="list-style-type: none"> • <i>Problem solving skills</i> • <i>Proficiency in ICT</i> • <i>Analytical skills</i> • <i>Managerial Skills</i>
POKOK BAHASAN/	<ul style="list-style-type: none"> • Review konsep optimasi dan prinsip dasar MCDM, preferensi dan pengukurannya, serta teknik pembobotan dan pengukuran kriteria. • Penyelesaian Multiobjektif (MOP) dengan pendekatan-agregasi tunggal : metoda global, fungsi utilitas, metode deviasi minimum, metode STEP, Goal Programming.

<p>SUBJECTS</p>	<ul style="list-style-type: none"> • Penyelesaian multikriteria (MCDM) dengan pendekatan agregasi total dan diskrit : AHP, Struktur dan hirarkhi problem kompleks, pengukuran preferensi dan penetapan bobot, indeks inkonsistensi, analisis sensitivitas. • Pendekatan MCDM berbasis agregasi parsial: metode ELECTRE I dan II, konsep <i>outranking</i> dan pemilihan metode, penilaian <i>concordance</i> dan <i>discordance</i>, penyelesaian <i>forward</i> dan <i>inverse</i>. • Pendekatan PROMETEE I. • <i>Optimization review and MCDM basic theory, its preferences and measurement, as well as weighting techniques and criteria measurement.</i> • <i>Multi objective solving method with single aggregation approach: global method, utility function, minimum deviation method, STEP method, and Goal Programming.</i> • <i>Multi criteria solving method with total and discrete aggregation: AHP, complex problem structure and hierarchy, preferences measurement and weight selection, inconsistency index, and sensitivity analysis.</i> • <i>Partial aggregation based method: ELECTRE I and II, outranking concept and methods selection, concordance and discordance assessment, forward and inverse solving method.</i> • <i>PROMETEE I techniques</i>
<p>PUSTAKA UTAMA/ REFERENCES</p>	<ul style="list-style-type: none"> • Bana et Costa C.A; <u>Readings in Multiple Criteria Decision Aid</u>, Berlin: Springer Verlag, 1994. • Lawrence, Kenneth.D, Gary R.Reeves and Ronald K.Limberg; "<u>Multi Criteria Aplications</u>", <u>Application of Management Science</u>, Vol.10 (2000), Elsevier Science. • Maystre L.Y., J.Pictet dan J. Simos, "<u>Methode Multicritere ELECTRE</u>", <u>Presses Polytechniques et Universitgires Romandes(1995)</u>, Lausanne. • Tabucanon, M.T; <u>Multipile Criteria Decision Making in Industry</u>, Elsevier, 1995. • Saaty, T.L.; "<u>Fundamental of Decision Making in Priority Theory</u>", <u>RWS Publications</u>, 1994. • Sen, Pratyush and Jian-Bo Yang, <u>Multiple Criteria Decision Support in Engineering Design</u>, Berlin: Springer Verlag, 1998. • Romero, C.; <u>Handbook of Critical Issues in Goal Programming</u>, London: Pergamon Press, 1992.

- Vincke, P., M.Gassner dan B.Roy, Multicriteria Decision Aid, Jon Willey and Sons , 1994.

MATA KULIAH/ COURSE TITLE	TI091408:Faal dan Biomekanika Kerja TI091408: <i>Occupational Physiology and Biomechanics</i> Credits: 3 Semester: VII/VIII
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TUJUAN PEMBELAJARAN/ LEARNING OBJECTIVES	Kuliah ini memberikan pemahaman kepada mahasiswa mengenai kelebihan dan kekurangan aspek faal dan biomekanika manusia saat bekerja, bagaimana mengukurnya, dan memanfaatkannya dalam mendesain sistem kerja yang ergonomis. <i>This course provides students with knowledge about human limitations and strengths in physiological and biomechanical aspects; how to measure them and to use the knowledge to design ergonomic work systems.</i>
KOMPETENSI/ COMPETENCY	<ul style="list-style-type: none"> • Perancang Sistem • Ketrampilan Sintesis, integrasi, dan perancangan • Ketrampilan Manajerial • <i>System designer</i> • <i>Synthesizing, integrating, and designing skills</i> • <i>Managerial skills</i>
POKOK BAHASAN/ SUBJECTS	<ul style="list-style-type: none"> • Pengantar fisiologi dan biomekanika kerja. • Pengukuran kapasitas dan beban kerja secara fisiologis. • Nutrisi dan kebutuhan energy kerja. • Sistem kerangka otot manusia. • Manual material handling. • <i>Introduction to occupational physiology and biomechanics.</i> • <i>Physiological work capacity and demand.</i> • <i>Nutrition and energy needs.</i> • <i>Musculoskeletal systems.</i> • <i>Manual material handling.</i>
PUSTAKA	<ul style="list-style-type: none"> • Astrand, <u>Textbook of Work Physiology</u>, Mc.Graw Hill, 2003 • Nurmianto, <u>Ergonomi : Konsep Dasar dan</u>

UTAMA/REFERENCES

Aplikasinya(Ergonomics : Basic Principles and Applications), Jakarta : Guna Widya, 1996.

MATA KULIAH/ COURSE TITLE	TI091425: Manajemen Rantai Pasok TI091425: Supply Chain Management Credits: 3 Semester: VII/VIII
TUJUAN PEMBELAJAR AN/ LEARNING OBJECTIVES	<p>Mata kuliah ini terkait dengan pengelolaan aliran barang dan informasi lintas organisasi dengan pendekatan integratif dan kolaboratif. Manajemen rantai pasok yang efektif menciptakan keunggulan dari sisi kecepatan respons maupun efisiensi. Tujuan mata kuliah ini adalah untuk memperkenalkan ke mahasiswa berbagai konsep, teknik, metode, maupun isu-isu praktis terkait dengan pengelolaan rantai pasok.</p> <p><i>The course is about managing material and information flows among organizations in a supply chain using integrative and collaborative approaches. An effective supply chain builds competitiveness in term of the responsiveness and efficiency. The course aims to give students understanding about various concepts, techniques, methods, as well as practical issues related to the supply chain management.</i></p>
KOMPETENSI/ COMPETENCY	<ul style="list-style-type: none">• Keterampilan sintesis, integrasi, dan perancangan• Keterampilan manajerial• Keterampilan memecahkan masalah• Keterampilan memanfaatkan teknologi informasi • <i>Synthesizing, integrating, and designing skills</i>• <i>Managerial skills</i>• <i>Problem solving skills</i>• <i>Proficiency in ICT</i>
POKOK BAHASAN/	<ul style="list-style-type: none">• Pengantar manajemen rantai pasok• Strategi rantai pasok, koordinasi produk dan desain rantai pasok, konfigurasi jaringan dan efek pooling permintaan.• Manajemen permintaan, manajemen persediaan terkoordinasi, kontrak dalam rantai pasok, manajemen pengadaan dan hubungan dengan pemasok• Beer Game dan permasalahan koordinasi, bulwhip effect

SUBJECTS	<ul style="list-style-type: none"> • Mengukur kinerja rantai pasok, penggunaan teknologi informasi dalam manajemen rantai pasok dan isu-isu global. • <i>Introduction to supply chain management.</i> • <i>Supply chain strategy, coordinated product and supply chain design, network configuration and demand pooling effect.</i> • <i>Demand Management, coordinated inventory management, Contract in supply chain, procurement management and supplier relationships.</i> • <i>The beer game and coordination issues, Bullwhip effect</i> • <i>Measuring supply chain performance, IT in supply chain management, global SC issues.</i>
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PUSTAKA UTAMA/ REFERENCES	<ul style="list-style-type: none"> • Chopra, S., and Meindl, P. (2007). <u>Supply chain management: Strategy, planning, and operations, 3rd Edition</u>. New Jersey - Prentice-Hall. • Simchi-Levi, D., Kaminski, P., and Simchi-Levi, E. (2000). <u>Designing and managing the supply chain: Concept, strategies, and case studies</u>. Irwin McGraw-Hill. • Pujawan, I N. (2005). <u>Supply Chain Management</u>. Guna Widya.
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MATA KULIAH/ COURSE TITLE	<p>TI091428 : Sustainable Manufacturing TI091428 : Sustainable Manufacturing Credits: 3 Semester: VII/VIII</p>
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TUJUAN PEMBELAJARAN/ LEARNING OBJECTIVES	<p>Mata kuliah ini merupakan mata kuliah pilihan yang didesain untuk memberikan pemahaman terhadap konsep keberlanjutan (<i>sustainability</i>), efeknya terhadap industri, dan berbagai teknik yang dapat digunakan untuk mencapai <i>sustainable manufacturing</i>. Dengan demikian diharapkan mahasiswa Teknik Industri nantinya akan menjadi sarjana plus yang memiliki kepekaan terhadap lingkungan dan mampu meningkatkan total kinerja industri.</p> <p><i>This course is designed to provide students with an understanding of sustainability issues, the concepts and the scope of SM, the strategies in SM, the management approaches in SM, and tools commonly used in SM. In the current situation, integrating sustainability into business process will enhance business's total performance and competitiveness. Skills developed and knowledge acquired from this course will prepare students to be environmentally conscious engineers who are</i></p>
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	<p><i>sensitive to environmentally related problems and capable to solve those problems and enhance total performance of industries.</i></p>
<p>KOMPETENSI/ COMPETENCY</p>	<ul style="list-style-type: none"> • Kemampuan mengakomodasikan isu lingkungan dan keberlanjutan • Perancang sistem • Keterampilan manajerial • <i>Ability to accommodate environmental issues & sustainabilities</i> • <i>System designer</i> • <i>Managerial skills</i>
<p>POKOK BAHASAN/ SUBJECTS</p>	<ul style="list-style-type: none"> • Sejarah <i>sustainable development</i>, konsep, ruang lingkup, dan dampaknya pada aspek kehidupan • <i>Sustainable manufacturing</i>, isu-isu <i>sustainability</i> makro, regulasi mengenai lingkungan dan implikasinya pada proses bisnis • <i>Upgrading</i>, penggunaan ulang, manufaktur ulang, dan daur ulang • <i>Life Cycle Management (LCM), Life Cycle Engineering (LCE), Life Cycle Assessment (LCA), and Life Cycle Costing (LCC)</i> • Manajemen data produk, <i>Technical Support</i>, dan Topik Khusus • <i>The history of sustainable development, concepts, scope, and the impacts in aspects of life</i> • <i>Sustainable manufacturing, macro sustainability issues, environmental regulations and the implications in business process</i> • <i>Upgrading, reuse, remanufacturing, and recycling</i> • <i>Life Cycle Management (LCM), Life Cycle Engineering (LCE), Life Cycle Assessment (LCA), and Life Cycle Costing (LCC)</i> • <i>Product Data Management (PDM), Technical Support (TS), and special issues.</i>
<p>PUSTAKA UTAMA/REFER ENCES</p>	<ol style="list-style-type: none"> 1. Billatos, S.B. and Basaly, N.A. (1997) <i>Green Technology and Design for the Environment</i>, Taylor & Francis 2. Curran, M.A. (1996) <i>Environmental Life-Cycle Assessment</i>, McGraw-Hill 3. Fiksel, J. (1997) <i>Design for Environment – Creating Eco – Efficient Products and Processes</i>, McGraw Hill 4. Hines, P. and Taylor, D. (2000) <i>Going Lean</i>, Lean Enterprise Research Centre, UK. 5. Steinhilper, R. (1998) <i>Remanufacturing: The Ultimate Form</i>

of Recycling, Fraunhofer IRB Verlag, Stuttgart
6. Proceeding of CIRP International Seminar on Life Cycle Engineering, 1994 – 2008

**MATA KULIAH/
COURSE**

**TI091419 : Pengukuran Kinerja
TI091419 : Performance Measurement**

TITLE

Credits: 3
Semester: VII/VIII

**TUJUAN
PEMBELAJARAN/LEARNING
OBJECTIVES**

Matakuliah pengukuran kinerja bertujuan untuk memberikan pemahaman mengenai konsep pengukuran kinerja perusahaan tradisional dan modern, contoh-contoh model pengukuran kinerja perusahaan yang tradisional maupun modern, konsep pengintegrasian sistem pengukuran kinerja karyawan dengan sistem pengukuran kinerja perusahaan.

The course aims to provide students with understanding of conventional and modern performance measurement concept, examples of performance measurement models in companies, and the concept of employee performance measurement and corporate performance measurement integration.

KOMPETENSI/COMPETENCIES

- Ketrampilan Sintesis, integrasi, dan perancangan
- Ketrampilan Manajerial
- Ketrampilan memecahkan masalah
- *Synthesizing, integrating, and designing skills*
- *Managerial skills*
- *Problem solving skills*

POKOK BAHASAN/SUBJECTS

- Konsep dasar pengukuran kinerja perusahaan
- Sistem pengukuran kinerja perusahaan tradisional dan modern dan model-modelnya.
- Konsolidasi *Key Performance Indicator*
- Penerapan sistem pengukuran kinerja perusahaan
- *Target setting*
- *Basic concept of corporate performance measurement*
- *Corporate Performance Measurement*

	<p><i>System: conventional and modern, corporate performance measurement system models.</i></p> <ul style="list-style-type: none"> • <i>Key Performance Indicator consolidation.</i> • <i>Corporate performance measurement system implementation.</i> • <i>Target Setting.</i>
PUSTAKA UTAMA/REFERENCES	<ol style="list-style-type: none"> 1. Kaplan and Norton. <i>Balanced Scorecard</i> 2. Kaplan and Norton. <i>Strategy Focus Organisation</i> 3. Neely, A., Adam., C., and Kennerly, M. <i>The Performance Prism</i> (London: Prentice Hall, 2002) 4. Spitzer, D.R., <i>Transforming Performance Measurement</i> (New York: Amacom, 2007)

MATA KULIAH/ COURSE TITLE	<p>T1091409: Keselamatan dan Kesehatan Kerja T1091409: <i>Health & Safety Management</i></p> <p>Credits: 3 Semester: VII/VIII</p>
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TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES	<p>Mahasiswa mampu mengidentifikasi berbagai jenis resiko kerja berdasarkan aspek keselamatan, kesehatan dan keamanan dengan mengacu pada regulasi Nasional dan Internasional.</p> <p><i>This course provides students with understanding of how to identify various health and safety risk in working environment as well as related international and national regulation.</i></p>
KOMPETENSI/COMPETENCY	<ul style="list-style-type: none"> • Perancang sistem • Ketrampilan mengakomodasikan isu lingkungan dan keberlanjutan • Ketrampilan managerial • <i>System designer</i> • <i>Ability to accommodate environmental issues & sustainabilities</i> • <i>Managerial skills</i>
POKOK BAHASAN/SUBJECTS	<ul style="list-style-type: none"> • Pengantar K3 dan Sistem Manajemen K3. • Loss Exposure & Loss Control (The Domino Effects). • Identifikasi Resiko dan Pengukuran Tingkat Resiko

PUSTAKA UTAMA/REFERENCES	<ul style="list-style-type: none"> • Prediksi Bahaya dan Rencana Penanggulangan Kecelakaan • Pengendalian Lingkungan Kerja. • <i>Introduction to Health and Safety Environment (HSE) and HSE system management.</i> • <i>Loss Exposure & Loss Control (The Domino Effects)</i> • <i>Risk identification and risk level measurements</i> • <i>Hazard prediction and accident prevention planning</i> • <i>Working environment controls</i>
	<ul style="list-style-type: none"> • Asfahl, C.Ray. (1999). Industrial Safety and Health Management, fourth edition. Prentice Hall, New Jersey. • Hammer, Willie & Price, Dennis. (2001). Occupational Safety Management and Engineering, fifth edition. Prentice Hall, New Jersey. • Nedved, Milos. (1991). Fundamentals of Chemical Safety and Major Hazard Control. International Labor Organization.

MATA KULIAH/ COURSE	TI091410: Aplikasi Ergonomi Industri
TITLE	TI091410: Applied Industrial Ergonomics
	Credits: 3
	Semester: VII/VIII

TUJUAN PEMBELAJARAN/	Tujuan perkuliahan ini adalah memahami aspek - aspek mengenai kemampuan, kelebihan serta keterbatasan manusia ketika berinteraksi dalam sistem kerjanya. Mampu menerapkan prinsip-prinsip ergonomi dalam aplikasi di industri.
LEARNING OBJECTIVES	<i>The course aims to provide students with understanding of human aspects, especially capabilities and strengths, as well as limitation when interacting with working system. Students are expected to be able to implement ergonomics principal in industry.</i>
KOMPETENSI/ COMPETENCY	<ul style="list-style-type: none"> • Ketrampilan sintesis, integrasi, dan perancangan • Ketrampilan memecahkan masalah • Perancang system • <i>Synthesizing, integrating, and designing skills</i> • <i>Problem solving skills</i>

POKOK BAHASAN/ SUBJECTS	<ul style="list-style-type: none"> • <i>System designer</i>
	<ul style="list-style-type: none"> • <i>Human Centered/Integrated Design</i> • <i>Ergonomics Principles in Industrial Application</i> • <i>Manipulative model (kinesiology)</i> • <i>Human computer interaction / usability analysis.</i> • <i>Cognitive model (thought)</i>
PUSTAKA UTAMA/ REFERENCES	<ol style="list-style-type: none"> 1. Konz, Stephan. <u>Work Design: Industrial Ergonomics</u>. Scottsdale, Arizona: Publishing Horizons, Inc., 1995. 2. Lehto, M. R and Buck, J.R. <u>Intoduction to Human Factors and Ergonomics for Engineers</u>. New York, 2008. 3. Stanton, N., Hedge, A., Brookhuis, K., Salas, E., and Hendrick, H. <u>Handbook of Human Factors and Ergonomics Methods</u>. CRC Press, 2005. 4. Tayyari, Fariborz and Smith, James L. <u>Occupational Ergonomics: Principles and Applications</u>. London : Chapman & Hall, 1997.

MATA KULIAH/ COURSE TITLE	TI091415 : Sistem Dinamik TI091415 : Dinamic System Credits: 3 Semester: VII/VIII
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TUJUAN PEMBELAJAR AN/ Learning Objectives	<p>Memberikan perspektif pendekatan metodologi Sistem Dinamik dalam memecahkan permasalahan sistem yang kompleks, membangun kemampuan memodelkan permasalahan-permasalahan kompleks, mensimulasikan model, memvalidasi model, menganalisa dan membuat skenario kebijakan yang sesuai dengan tujuan system. Mata kuliah ini juga memberikan kemampuan untuk melihat sebuah permasalahan secara menyeluruh sehingga dapat melahirkan kebijakan-kebijakan dalam melakukan penyikapan atas permasalahan kompleks tersebut.</p> <p><i>To give an overview of Dynamic System approach methods in solving system complex problems, to develop students' ability to model complex problems, simulate the models, validate the models, to analyze and to develop improvement scenarios related to the system purpose. It also provides students with practices on how to view a problem comprehensively in taking actions regarding the complex problem.</i></p>
KOMPETENSI/	<ul style="list-style-type: none"> • Keterampilan memecahkan masalah

Competencies	<ul style="list-style-type: none"> • Perancang Sistem • Ketrampilan Sintesis, integrasi, dan perancangan • <i>Problem solving skills</i> • <i>System designer</i> • <i>Synthesizing, integrating, and designing skills</i>
Pokok Bahasan/ Subject	<ul style="list-style-type: none"> • Konsep dasar metodologi Sistem Dinamik: pengenalan dalam berpikir sistem dan proses permodelannya, struktur dan perilaku sistem dinamik. • Batasan sistem, diagram sebab akibat: struktur dan perilaku dalam sistem umpan balik positif-negatif tunggal, struktur dan perilaku dalam umpan balik positif-negatif jamak. • Menganalisa masalah-masalah sederhana, pengenalan simulasi: konsep aliran materi dan informasi, persamaan level, persamaan rate, auxiliary, konstanta/parameter dan multiplier. • Pengenalan konsep delay material dan informasi dalam sistem, konsep pulse dan step, konsep fungsi, konsep smoothing. • Pendekatan sistem dinamik dalam analisa perancangan dan kebijakan • Validasi model sistem dinamik, skenario kebijakan, dan analisa sensitivitas. • <i>Basic concepts of Dinamic System methodology: introduction in system thinking and modeling process, structure and dynamic system behaviour.</i> • <i>System boundary, causal loop diagram: structure and behaviour in single multiple positive and negative feedback loop.</i> • <i>Simple problems analysis, simulation introductory: material and information flow concepts, level equation, rate equation, auxiliary, constants/parameters and multiplier.</i> • <i>Introduction to the concept of material and information delay in a system, pulse and step concepts, function concepts, smoothing concepts.</i> • <i>Dinamic system approach in analyzing design and policies.</i> • <i>Validation of dynamic system models, policies scenario, and sensitivity analysis.</i>
Referensi/ References	<ul style="list-style-type: none"> • John D. Sterman : Business Dinamics : Systems Thinking and Modeling for Complex World. • Leslie A. Martin : Beginner Modeling Exercises, MIT System Dynamics in Education Project Under the Supervision of Dr. Jay W. Forrester. September 5, 1997 • Joseph G. Whelan : Modeling Exercises I, MIT System Dynamics Education Project Under the Supervision of Dr. Jay W. Forrester, May, 1994 • Joseph G. Whelan revised by Lucia Breierova, Modeling

	<p>Exercises II, MIT System Dynamics Education Project Under the Supervision of Dr. Jay W. Forrester January 13, 1997</p> <ul style="list-style-type: none"> • Jay W. Forrester, System Dynamics, Systems Thinking, and Soft OR, Sloan School of MIT, August 18, 1992. • Bell, J.A., and Senge, P.M. Enhancing refutability. In: Legasto, A.A. Jr.; Forrester, M.W.; and Lyneis, T.M., eds. System Dynamics . Elsevier North-Holland, 1980
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MATA KULIAH/ COURSE TITLE	<p>TI091402 : Manajemen Material dan Pengadaan TI091402 : <i>Procurement and Material Management</i> Credits: 3 Semester: VII/VIII</p>
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TUJUAN PEMBELAJARAN/ LEARNING OBJECTIVES	<p>Procurement & material Management mencakup materi yang terkait dengan pengadaan material dan manajemen material dari supplier sampai dengan di dalam proses produksi. Aktifitas meliputi perencanaan pengadaan material dan teknik-teknik perencanaan pengadaan. Metode-metode pemilihan dan evaluasi supplier. Tujuan mata kuliah ini adalah untuk memperdalam konsep pengadaan dan manajemen material dan model- model yang terkait dengan masalah tersebut. Dan membahas studi kasus dari journal-journal yang relevan.</p> <p><i>The course includes the topics related to the material procurement and management, from suppliers to the production process. It also includes material procurement planning and the techniques of procurement planning. It aims to discuss in depth about procurement concept and material management as well as related models in this topic. Case studies and relevant journals will be discussed in this course for enrichment.</i></p>
KOMPETENSI/ COMPETENCY	<ul style="list-style-type: none"> • Keterampilan sintesis, integrasi, dan perancangan • Keterampilan manajerial • Perancang sistem • <i>Synthesizing, integrating, and designing skills</i> • <i>Managerial skills</i> • <i>System designer</i>
POKOK BAHASAN/	<ul style="list-style-type: none"> • Pengantar sistem produksi dan konteks perencanaan dan pengendalian produksi. • Peramalan permintaan, perencanaan produksi agregat, pengelolaan persediaan. • Jadwal induk produksi, perencanaan kebutuhan bahan, perencanaan kapasitas, pengendalian aktifitas produksi.

SUBJECTS	<ul style="list-style-type: none"> • Beberapa teknik lain: <i>Just In Time, Theory of Constraint</i> • Pengenalan ERP, dan pengenalan CPFR dalam konteks SCM • <i>Introduction to production system and production planning and control context.</i> • <i>Demand forecasting, aggregate production planning, inventory management.</i> • <i>Production master plan, material requirements planning, capacity planning, production activity control.</i> • <i>Other techniques: Just In Time, Theory of Constraint</i> • <i>Introduction to ERP and CPFR in SCM context</i>
PUSTAKA UTAMA/ REFERENCES	<ol style="list-style-type: none"> 1. Arnold, J.R.T., dan Chapman, S.N., (2004), <i>Introduction to Material Management</i>, Fifth Edition, Pearson Prentice-Hall, Upper Saddle River, New Jersey 2. Dobler, D. W., Burt, D.N., and Lee, Jr., L., (1990), <i>Purchasing and Materials Management Text and Cases</i>, Fifth Edition, McGraw-Hill International Edition, Singapore 3. Tersine, Richard J., (1994), <i>Principle of Inventory and Materials Management</i>, Fourth Edition, Prentice-Hall International, London 4. Vollmann, T., Berry, W., Whybark, C., and Jacobs, R. (2005). <i>Manufacturing Planning and Control Systems for Supply Chain Management</i> Fifth Ed., McGraw-Hill.

MATA KULIAH/ COURSE TITLE	<p>TI091429 : Data Mining TI091429 : Data Mining</p> <p>Credits: 3 Semester: VII/VIII</p>
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TUJUAN PEMBELAJARAN/ Learning Objectives	<p>Membahas teknik-teknik dalam data mining, kasus-kasus di mana data mining bisa diterapkan, mengenalkan pemakaian software untuk implementasi. Tujuan mengenalkan teknik-teknik data mining untuk prediksi, klasifikasi dan clustering, penghitungan dan penerapan untuk bidang perbankan, telekomunikasi dan marketing dengan menggunakan software.</p> <p><i>The course aims to discuss about data mining techniques and cases in which data mining can be applied, as well as to introduce the use of software for data mining application. Data mining techniques provides a prediction, classification and clustering, which can be applied in banking, telecommunication, and marketing with the help of software.</i></p>
KOMPETENSI/ Competencies	<ul style="list-style-type: none"> • Keterampilan memecahkan masalah • Keterampilan memanfaatkan teknologi informasi

	<ul style="list-style-type: none"> • Ketrampilan Sintesis, integrasi, dan perancangan • <i>Problem solving skills</i> • <i>Proficiency in ICT</i> • <i>Synthesizing, integrating, and designing skills</i>
Pokok Bahasan/ Subject	<ul style="list-style-type: none"> • Pendahuluan, data preprocessing. • Pengklusteran dan analisis diskriminan. • Neural network, decision tree, support vector machine. • Heuristic dalam data mining • Kernel data mining. • <i>Introduction and data preprocessing</i> • <i>Clustering and discriminants analysis</i> • <i>Neural network, decision tree, support vector machine.</i> • <i>Heuristics in data mining</i> • <i>Data mining Kernel</i>
Referensi/ References	<ul style="list-style-type: none"> • Intro to business data mining, David olson, Yong shi • Data Mining teknik pemanfaatan data untuk keperluan bisnis, budi santosa, Graha Ilmu 2007 • Data Mining Terapan dengan matlab (budi santosa, 2007), Graha Ilmu • Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Prentice Hall • Advanced data Mining Techniques, David L. Olson Dursun Delen, e-book • Mastering data Mining, the art and science of CRM (Michael J Berry, Gordon S

MATA KULIAH/ COURSE	TI091424: Ergonomi Makro
TITLE	TI091424: <i>Macro Ergonomics</i>
	Credits: 3
	Semester: VII/VIII

TUJUAN PEMBELAJARAN/LEARNING OBJECTIVES	Mata kuliah Ergonomi makro meliputi suatu analisa, desain, dan evaluasi organisasi dan sistem kerja yang dirancang melalui suatu pendekatan <i>holistic</i> atas dasar interaksi antara manusia mesin, pengguna dan sistem, manusia dan lingkungan dengan menempatkan teknologi baru ke dalam satu kesatuan sistem yang utuh. Tujuan mata kuliah ini adalah membekali mahasiswa dengan
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	<p>kemampuan identifikasi suatu sistem industri pada tingkat makro [antar organisasi].</p> <p><i>This course includes analysis, design, and organization evaluation and work system of which designed with holistic approach based on human-machine interaction, system and users, human and environment by placing new technology in one whole system. It aims to provide students with skills to identify and analyze industrial system in a macro level (intra-organizations)</i></p>
<p>KOMPETENSI/COMPETENCY</p>	<ul style="list-style-type: none"> • Ketrampilan Sintesis, integrasi, dan perancangan • Perancang sistem • Ketrampilan manajerial • <i>System designer</i> • <i>Synthesizing, integrating, and designing skills</i> • <i>Managerial skills</i>
<p>POKOK BAHASAN/</p>	<ul style="list-style-type: none"> • Konsep dasar ergonomic dan perkembangan ergonomic dalam HSI, Pengantar Ergonomi Makro; Basic Principle : organisasi, sistem kerja, produktivitas, error, complexity, dan perilaku manusia. • Klaster Industri sebagai contoh studi kasus Ergonomi Makro , Konsep pemodelan sistem atau Simulasi sistem dinamik, <i>Participatory concept and The Team</i> • Analisa system kerja dengan SAT [System Analysis Tool] dan MAS [Macroergonomics Analysis of Structure] • Macroergonomics method 1: Macroergonomics Organizational Questionnaire Survey [MOQS]; Macroergonomics method 2 : HITOP Analysis [High Integration of Technology, Organization, and People]; Macroergonomics method 3: TOP – Modeler; Macroergonomics method 4: The CIMOP system [Computer Integrated Manufacturing, Organization, and People]; Macroergonomics method 5: Anthropotechnology [terdiri atas: physical anthropology/ body dimension, cultural anthropology/ value system, cognitive anthropology/ cognitive model]; Macroergonomics method 6: Macroergonomic Analysis dan Design [MEAD]
<p>SUBJECTS</p>	

	<ul style="list-style-type: none"> • Studi kasus Ergonomi Makro. • <i>Ergonomics basic concept and its development in HIS, introduction to Macro Ergonomics, basic principle: organization, work system, productivity, error, complexity, and human behavior.</i> • <i>Industrial cluster as a case study Macro Ergonomics, system modeling concept or dynamics system simulation, Participatory concept and The Team</i> • <i>Work system analysis using SAT (System Analysis Tool) and Macroergonomics Analysis of Structure (MAS).</i> • <i>Macroergonomics method 1: Macroergonomics Organizational Questionnaire Survey [MOQS]; Macroergonomics method 2: HITOP Analysis [High Integration of Technology, Organization, and People]; Macroergonomics method 3: TOP – Modeler; Macroergonomics method 4: The CIMOP system [Computer Integrated Manufacturing, Organization, and People]; Macroergonomics method 5: Anthropotechnology [terdiri atas: physical anthropology/body dimension, cultural anthropology/ value system, cognitive anthropology/ cognitive model]; Macroergonomics method 6: Macroergonomic Analysis dan Design [MEAD]</i> • <i>Macroergonomics case studies</i>
<p>PUSTAKA UTAMA/REFERENCES</p>	<ul style="list-style-type: none"> • Lehto, M. R. et al (2008) Introduction and Human Factors and Ergonomics for Engineers. • Lewis, G. (2006) Organizational Crisis Management, The Human Factor. Auerbach Publications • Pierre, M., et al (2008) Crisis Management in Acute Care Settings. Human Factors and Team Psychology in a High Stakes Environment. • Stanton, N., et al (2005) Handbook of Human Factors and Ergonomics Method. CRC Press.

