UNIVERSITAS NEGERI PADANG

DAFTAR MATAKULIAH
TAHUN KURIKULUM : 2019 [2019]

Fakultas : **Fakultas Teknik**
Prog. Studi : Teknik Mesin (D3)

No	Kode	Matakuliah	SKS				Semester
			Jml	T	P	L	
1). Mata Kuliah Wajib Universitas							
A. Wajib							
1	UNP1.50.1401	Bahasa Inggris (*English*)	2	2	0	0	1
2	UNP1.50.1404	Pendidikan Kewarganegaraan (*Citizenship Education*)	2	2	0	0	1
3	UNP1.50.1405	Bahasa Indonesia (*Indonesian*)	2	2	0	0	1
4	UNP1.50.2401	Pendidikan Agama (*Religius Education*)	3	3	0	0	2
5	UNP1.50.2402	Pendidikan Pancasila (*Pancasila Education*)	2	2	0	0	2
6	UNP1.50.3101	Kewirausahaan (*Entrepreneurship*)	3	3	0	0	3
		Jumlah SKS	14	14	0	0	
2). Mata Kuliah Pilihan Universitas							
A. Pilih 2 SKS dari 6 SKS							
1	UNP2.50.1401	Ilmu Sosial Budaya Dasar (*Ilmu Sosial Basic Culture*)	2	2	0	0	1
2	UNP2.50.1402	Ilmu Kealaman Dasar (*Basic Natural Science*)	2	2	0	0	1
3	UNP2.50.3402	Teknologi Informasi dan Komunikasi (*Information and communication technology*)	2	0	2	0	3
		Jumlah SKS	6	4	2	0	
3). Mata Kuliah Wajib Program Studi							
A. Wajib							
1	MES1.52.1008	K3 dan Hukum Ketenagakerjaan (*Employment Law and K3*)	2	2	0	0	1
2	MES1.52.1009	Gambar Teknik (*Engineering Drawings*)	2	0	2	0	1
3	MES1.52.1010	Fabrikasi (*Fabrication*)	3	0	3	0	1
4	MES1.52.1011	Teknik Kerja Bangku (*Benches Working Engineering*)	3	0	3	0	1
5	MES1.52.1012	Matematika (*Mathematics*)	2	2	0	0	1
6	MES1.52.1013	Kimia Terapan (*Applied Chemistry*)	2	2	0	0	1
7	MES1.52.2010	Fisika Terapan (*Applied Physics*)	3	2	1	0	2
8	MES1.52.2011	Matematika Terapan (*Applied Mathematics*)	2	2	0	0	2
9	MES1.52.2012	Gambar Mesin (*Mechanical Drawing*)	2	0	2	0	2
10	MES1.52.2013	Dasar Pemrograman Komputer (*Computer Programming Basic*)	2	1	1	0	2
11	MES1.52.2014	Teknik Pembentukan Logam (*Sheet Metal Forming*)	3	0	3	0	2
12	MES1.52.2015	Teknologi Pemesinan (*Machining Technology*)	3	0	3	0	2
13	MES1.52.2016	Teknik Listrik dan Elektronika Dasar (*Electrical and Basic Electronics Engineering*)	2	2	0	0	2
14	MES1.52.3009	Mekanika Teknik (*Engeneering Mechanics*)	3	3	0	0	3
15	MES1.52.3010	Thermodinamika (*Thermodynamics*)	2	2	0	0	3
16	MES1.52.3011	Kinematika dan Dinamika (*Kinematics and Dynamics*)	2	2	0	0	3
17	MES1.52.3012	Mesin Konversi Energi (*Energy Conversion Machine*)	2	2	0	0	3
18	MES1.52.3013	Teknologi dan Pengujian Bahan (*Technology and Testing of Materials*)	3	1	2	0	3
19	MES1.52.3014	Metrologi Industri (*Industrial Metrology*)	3	1	2	0	3
20	MES1.52.3015	Teknologi Pengelasan Logam (*Metal Welding Technology*)	3	0	3	0	3
21	MES1.52.3016	Teknologi Mesin Perkakas (*Machining Tools Technology*)	3	1	2	0	3
22	MES1.52.4009	CAD & CAM (*Computer Aided Design And Computer Aided Manufacturing*)	2	0	2	0	4
23	MES1.52.4010	Elemen Mesin (*Machine Elements*)	2	2	0	0	4
24	MES1.52.4011	Mekanika Fluida (*Fluid Mechanics*)	2	2	0	0	4

25	MES1.52.4012	Mekatronika (*Mechatronics*)	2	2	0	0	4
26	MES1.52.4013	Fenomena Dasar Mesin (*Machine Basic Phenomena*)	2	0	2	0	4

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No	Kode	Matakuliah	SKS				Semester
			Jml	T	P	L	
27	MES1.52.4014	Mesin Teknologi Terapan (*(Applied Machine Technology)*)	2	1	1	0	4
28	MES1.52.4015	Pemograman CNC (*CNC Programming*)	3	1	2	0	4
29	MES1.52.4016	Pemeliharaan Mesin (*Machine Maintenance*)	3	1	2	0	4
30	MES1.52.5007	Teknik Pendingin (*Refrigeration and Air Conditioning*)	2	2	0	0	5
31	MES1.52.5008	Instalasi Pabrik (*Lay Out of Factory*)	2	1	1	0	5
32	MES1.52.5009	Hidrolik dan Pneumatik (*Hydraulics and Pneumatics*)	2	1	1	0	5
33	MES1.52.5010	Manajemen Proyek dan Industri (*Project and Industrial Management*)	2	1	1	0	5
34	MES1.52.5011	Bahasa Inggris Teknik (*Engineering English*)	2	1	1	0	5
35	MES1.52.5012	Tata Tulis Karya Ilmiah dan Seminar (*Scientific Writing Guide and Seminars*)	2	2	0	0	5
36	MES1.52.5013	Praktek Industri (*Industrial Experience*)	3	0	0	3	5
		Jumlah SKS	85	42	40	3	
B. Tugas Akhir/Skripsi							
1	MES1.52.6002	Proyek Akhir (*Final Project*)	4	0	0	4	6
		Jumlah SKS	4	0	0	4	
4). Mata Kuliah Pilihan Program Studi							
A. Pilih 4 SKS dari 12 SKS							
1	MES2.52.4007	Teknologi Proses Permesinan (*Machining Process Technology*)	2	1	1	0	4
2	MES2.52.4008	Teknik Pengarah dan Penepat (*Jig and Fixture Engineering*)	2	0	2	0	4
3	MES2.52.4009	Pesawat Angkat (*(Elevate Equipment)*)	2	1	1	0	4
4	MES2.52.4010	Rekayasa Berbantuan Komputer (CAE) (*Computer Aided Engineering*)	2	0	2	0	4
5	MES2.52.4011	Teknologi Proses Fabrikasi (*Fabrication Process Technology*)	2	1	1	0	4
6	MES2.52.4012	Las MIG dan TIG (*MIG and TIG Welding*)	2	0	2	0	4
		Jumlah SKS	12	3	9	0	
B. Pilih 6 SKS dari 18 SKS							
1	MES2.52.5007	Teknologi Produksi Permesinan (*Machining Production Technology*)	3	0	3	0	5
2	MES2.52.5008	Teknik Produksi dan Pemograman NC (*Production Engineering and NC Programming*)	3	1	2	0	5
3	MES2.52.5009	Rancangan Konstruksi Mesin (*Machine Construction Designs*)	3	1	2	0	5
4	MES2.52.5010	Teknik Rekayasa (*Design Engineering*)	3	1	2	0	5
5	MES2.52.5011	Penerapan Pengujian Mutu Las (*Implementation of Weld Quality Testing*)	3	1	2	0	5
6	MES2.52.5012	Teknologi Produksi Fabrikasi (*(Fabrication Production Technology)*)	3	0	3	0	5
		Jumlah SKS	18	4	14	0	

Sinopsis (Synopsis)

UNP1.50.1401 Bahasa Inggris (English) 2 SKS

Mata kuliah ini berisi tentang pengembangan keterampilan berbahasa Inggris secara terpadu dengan memperhatikan kebutuhan mahasiswa sesuai bidang/ jurusannya, meliputi pemahaman pola-pola kalimat dasar yang membantu mahasiswa memahami berbagai referensi berbahasa Inggris dan membekali mahasiswa dengan keterampilan berkomunikasi dalam bahasa Inggris sesuai bidang keahliannya.

(*This course develops students' English skills by considering their needs. It also includes the comprehension of basic sentence patterns which helps them in reading various English references. In addition, it also strengthens students' communication skill in English.*)

UNP1.50.1404 Pendidikan Kewarganegaraan (Citizenship Education) 2 SKS

Mata kuliah ini berisi tentang hakikat pendidikan kewarganegaraan dalam mengembangkan kemampuan utuh sarjana atau profesional; esensi dan urgensi identitas nasional sebagai salah satu deteminan pembangunan bangsa dan karakter, urgensi integritas nasional persatuan dan kesatuan bangsa; nilai dan norma konstitusional UUD NRI 1945 dan konstitusional ketentuan perundang-undangan di bawah UUD; harmoni kewajiban dan hak negara dan warga negara dalam demokrasi yang bersumber pada kedaulatan rakyat dan musyawarah untuk mufakat; hakikat, instumentasi, dan praksis demokrasi Indonesia berlandaskan Pancasila dan UUD NRI 1945; dinamika historis konstitusional, sosial-politik, kultural, serta konteks kontemporer penegakan hukum yang berkedaulatan; dinamika historis dan urgensi wawasan nusantara sebagai konsepsi dan pandangan kolektif kebangsaan Indonesia dalam konteks pergaulan dunia; urgensi dan tantangan nasional dan bela negara bagi Indonesia dalam membangun komitmen kolektif kebangsaan
(*This course contains the idea of the nature of civic education in developing the ability of a whole graduate or professional; The essence and urgency of national identity as one of the determinants of nation-building and character, the urgency of the national integrity of the unity and unity of the nation; Constitutional values ??and norms of the 1945 Constitution and the constitutional provisions of legislation under the Constitution; Harmony of obligations and rights of state and citizens in a democracy stemming from popular sovereignty and deliberation to consensus; The nature, instrumentation, and praxis of Indonesian democracy based on Pancasila and the 1945 Constitution of the Republic of Indonesia; Historical, constitutional, socio-political, cultural, and contemporary contexts of sovereign law enforcement; Historical dynamics and urgency of the archipelago's insight as the conception and collective view of Indonesian nationality in the context of world affairs; Urgency and national challenge and defend the country for Indonesia in building the collective commitment of nationhood.*)

UNP1.50.1405 Bahasa Indonesia (Indonesian) 2 SKS

Mata Kuliah ini berisi tentang Konsepsi Bahasa Indonesia, Sejarah Bahasa Indonesia, Kedudukan dan Fungsi Bahasa Indonesia, ragam Bahasa Indonesia, Ejaan Bahasa Indonesia,(huruf tanda baca, kata dan unsur serapan: Kalimat Efektif, Pengertian Ciri, Syarat Kalimat Efektif: Paragraf,,Jenis, Fungsi dan Pengembanganya: Kerangka Tulisan Tema ,Topik, Judul dan Jenis Kerangka Tulisan: Teks Tulisan (Teks Akademis Ilmiah dan Teks non Akademis: Surat Resmi BI (Format dan Jenis Surat Resmi Bahasa Indonesia
(*This course contains Indonesian Conceptions, Indonesian History, Indonesian Language Position and Functions, Indonesian Variety, Indonesian Spelling (punctuation letters, words and elements of absorption: Effective Sentences, Definition of Characteristics, Terms of Effective Sentences: Paragraphs, Types, Functions and Development: The Theme Writing Framework, Topics, Titles and Types of Writing Framework: Text of Writing (Academic Scientific Text and Non-Academic Texts: BI's Official Letters (Formats and Kinds of Indonesian Official Letters*)

UNP1.50.2401 Pendidikan Agama (Religius Education) 3 SKS

ata kuliah ini berisi tentang: Tuhan Yang Maha Esadan Ketuhanan: kemanan dan ketaqwaan, filsafat ketuhanan (Teologi); Manusia: hakikat manusia, martabat manusia, tanggung jawab manusia; Hukum: menumbuhkan kesadaran untuk taat hukum Tuhan, fungsi profetik agama dalam hukum: Moral: agama sebagai sumber moral, akhlak mula dalam kehidupan; Ilmu Pengetahuan, Teknologi dan Seni: Iman, Iptek, dan amal sebagai kesatuan, kewajiban menuntut dan mengamalkan ilmu, tanggung jawab ilmuwan dan seniman; kerukunan antarumat beragama: agama merupakan rahmat Tuhan bagi semua, kebersamaan dalam pluralitas beragama; Masyarakat: masyarakat beradab dan sejahtera, peran umat beragama dalam mewujudkan masayarakat beradab dan sejahtera, Hak Asasi Manusia (HAM) dan demokrasi; Budaya: budaya akademik, etos kerja, sikap terbuka dan adil; Politik: kontribusi penganut agama dalam kehidupan berpolitik, peranan penganut agama dalam mewujudkan persatuan dan kesatuan bangsa
(*This course contains: The idea of God the Supreme, Godhead: security and devotion, philosophy of God (Theology); Man: human nature, human dignity, human responsibility; Law: raising an awareness to obey God's law, prophetic functions of religion in law: Moral: religion as a moral source, morality in life; Science, Technology and Art: Faith, science and technology as a unity, the obligation to demand and practice science, the responsibility of scientists and artists; Interreligious harmony: religion is God's grace to all, togetherness in religious plurality; Society: civilized and prosperous society, the role of religious people in realizing civilized and prosperous society, human rights and democracy; Culture: academic culture, work ethic, open and fair attitude; Politics: the contribution of adherents of religion in political life, the role of adherents of religion in realizing the unity and unity of the nation.*)

UNP1.50.2402 Pendidikan Pancasila (Pancasila Education) 2 SKS

Mata kuliah ini berisi tentang pengertiian urgensi dan alasan diperlukannya pendidikan Pancasila di Perguruan Tinggi; Pancasila dalam arus sejarah bangsa Indonesia; Pancasila sebagai sistem filsafat, sebagai dasar negara Republik Indonesia, sebagai ideologi negara, sebagai sistem etika, dan Pacasila menjadi dasar nilai pengembangan ilmu; Pemikiran dan pelaksanaan Pancasiladalam menghadapi permasalahan-permasalahan aktual dewasa ini, seperti masalah HAM, SARA, dan Kritis ekonomi, serta masalah radikalisme yang harus dipecahkan sesuai dengan nilai-nilai Pancasila.
(*This course contains an idea of an understanding of urgency and the reason for the need for Pancasila education in Higher Education; Pancasila in the history of the Indonesian nation; Pancasila as a system of philosophy, as the basis of the Republic of Indonesia, as the state ideology, as an ethical system, and Pancasila as the basis of the value of science development; The thinking and implementation of Pancasila in facing the actual problems, such as human rights, SARA, critical economics, as well as the problem of radicalism that must be solved in accordance with the values ??of Pancasila*)

UNP1.50.3101 Kewirausahaan (Entrepreneurship) 3 SKS

mata kuliah ini berisi tentang pengetahuan, sikap dan keterampilan berlandaskan kepada pemikiran yang kreatif dan inovatif mengenai prinsip dasar kewirausahaan, model pengembangan kewirausahaan, strategi kewirausahaan, etika bisnis dalam kewirausahaan, analisis peluang, study kelayakan usaha dan manajemen pengelolaan usaha (pemasaran, produksi, keuangan, sumber daya, legalitas usaha, teknologi dan informasi)
(*this course contains knowlege, attitude and skills based on creative and innovative thinking about the basic principle of entrepreneurship, entrepreneurship development model, enrepreneurship srategy, business ethics in entreneurship, bisiness devoloment model, entrepreneurship strategy, bisiness etchics in entrepreneurship, business opportunity analysis, business feasibility study and business management (marketing, finance, resourse, business, legality, technology and imformation)*)

UNP2.50.1401 Ilmu Sosial Budaya Dasar (Ilmu Sosial Basic Culture) 2 SKS

Mata kuliah ini berisikan tentang : konsep-konsep dasar ilmu sosial dan budaya untuk mengkaji masyarakat indonesia dan perubahan masyarakat dan budaya indonesia, pokok bahasan yaitu manusia dan kebudayaan manusia dan peradaban manusia sebagai individu dan makhluk sosial maupun nilai moral dan hukum, manusia keselarasan dan kesederjatan manusia sains, teknologi dan seni, manusia dan lingkungan
(*is course contains: Basic concepts in the social and cultural sciences to study Indonesian society and the change of Indonesian society and culture. The subjects of human and human culture as individuals and human social beings, moral values and human laws of human diversity and mercantilism, the science of technology and the art of man and of the environmentis*)

UNP2.50.1402 Ilmu Kealaman Dasar (Basic Natural Science) 2 SKS

Mata Kuliah ini berisi hakekat dan ruang lingkup alam pikiran manusia dan perkembanganya, perkembangan IPA, bumi dan alam semesta keanekaragaman makhluk hidup dan penyebaranya, makhluk hidup dalam ekosistem alami, sumber daya alam dan lingkungan, manfaat dan dampak IPA dan teknologi terhadap kehidupan sosial, sejarah peradapan manusia dan perkembangan teknologi, beberapa perkembangan teknologi penting, dan isu lingkungan
(*his course contains the nature and scope of the human mind and its development, the development of science, the earth and the universe of the diversity of living creatures and its cultivators, living creatures in natural ecosystems, natural and environmental resources, the benefits and impacts of science and technology on social life, Human confrontation and technological development, several important technological developments, and environmental issues*)

UNP2.50.3402 Teknologi Informasi dan Komunikasi (Information and communication technology) 2 SKS

Mata kuliah ini mempelajari tentang teknologi informasi dan komunikasi yang mampu mempermudah pekerjaan sehari-hari. Memahami penggunaan perangkat lunak "Aplikasi Office", Teknologi Internet, Penggunaan perangkat lunak pengembangan animasi pembelajaran, pengembangan teknologi dan penggunaan aplikasi di bidang pendidikan serta mampu mengenal bisnis berbasis internet.
(*This course studies about information and communication technology that can help the daily work. Understand the use of Office Application software, Internet technology, Use of learning animation development software, technology development and application usage in the field of education and be able to know internet based business.*)

MES1.52.1008 K3 dan Hukum Ketenagakerjaan (Employment Law and K3) 2 SKS

Memberikan pengetahuan terhadap mahasiswa dalam memahami kebijakan Pemerintah mengenai perlindungan terhadap keselamatan kerja, Standar Kesehatan dan Keselamatan Kerja, pencegahan kecelakaan kerja, resiko kecelakaan kerja, manajemen keselamatan kerja, alat-alat pengaman, peraturan ketenagakerjaan, metode dan jenis metode kerja.
(*Providing knowledge to students in understanding Government policies regarding protection of occupational safety, Occupational Health and Safety Standards, prevention of workplace accidents, risk of workplace accidents, management of occupational safety, labor law, safety equipment, labor regulations, methods and types of work methods.*)

MES1.52.1009 Gambar Teknik (Engineering Drawings) 2 SKS

Memberikan pengetahuan tentang: teknik menggambar menggunakan alat dan instrumen gambar, Standarisasi garis-garis gambar, huruf dan angka, konstruksi geometri, Proyeksi ortogonal, Aturan dasar untuk penyajian gambar, teknik pemotongan (irisan) benda kerja, Menggambarkan bagian yang dikerjakan secara khusus 2D dan 3D, teknik ukuran. Daftar Bacaan: ISO 1101, Technical Drawings, International Organization for Standardization, Colin Simmons & Dennis Maguire, Manual of Engineering Drawing, Menggambar Teknik Basis A. Jakarta. Ghalia Indonesia. Said Sugardi. (1996). Instumrnt Gambar. Padang. FTK IKIP Padang Sugiarto N.H. (1987). Menggambar Mesin Menurut Standar ISO. Jakarta. PT. Pradnya Paramita. Wegmuler
(*Provides knowledge of: drawing techniques using drawing tools and instruments, Standardization of drawing lines, letters and numbers, geometrical constructions, orthogonal projections, basic rules for the presentation of drawings, cutting techniques of workpieces, describes parts of work specifically 2D and 3D, size engineering. Reading List: ISO 1101, Technical Drawings, International Organization for Standardization, Colin Simmons & Dennis Maguire, Manual of Engineering Drawing, Drawing Technique Base A. Jakarta. Ghalia Indonesia. Said Sugardi. (1996). Instumrnt Image. Padang. FTK IKIP Padang Sugiarto N.H. (1987). Drawing Machine According to ISO Standards. Jakarta. PT. Pradnya Paramita. Wegmuler*)

MES1.52.1010 Fabrikasi (Fabrication) 3 SKS

Memberikan pengetahuan dan keterampilan tentang menggambar bentangan pada plat, memotong/menggunting, menekuk, melipat, membentuk, mengerol, menyambung dan merakit plat pada pekerjaan plat-plat tipis serta aplikasinya di lapangan seperti Ducting System, Semuanya diaplikasikan dalam pembuatan benda kerja terpakai dan tepat guna
(*Provides knowledge and skills about drawing a stretch on the plate, cutting / cutting, bending, folding, forming, gripping, connecting and assembling the plate on the work of thin plates and its applications in the field such as Ducting System, All applied in the manufacture of used and appropriate workpieces*)

MES1.52.1011 Teknik Kerja Bangku (Benches Working Engineering) 3 SKS

Memberikan pengetahuan, sikap dan keterampilan dasar dalam kegiatan praktik pengerjaan benda kerja menggunakan alat perkakas tangan, cara penggunaan alat tangan dengan bantuan instrumen pengukuran semi presisi dan presisi meliputi penggunaan alat perkakas kikir, gergaji tangan, mesin bor, dan membuat alur pengerjaan berdasarkan pada gambar kerja serta merealisasikannya. Daftar bacaaan: Daftar bacaaan: Christopher Schwarz, (2007), Workbenches: From Design And Theory To Construction And Use. Stefford, John dan Guy McMurdo, 1982, Teknologi Kerja Logam, Erlangga, Jakarta. C. Van Terheidjen. Bina Cipta. Bandung, Repp, Victor E. (1984). Machine Tool Technology. McKnight Publishing Company
(*Providing basic knowledge, attitudes and skills in workpiece work practices using hand tools, hand tools with the help of semi-precision and precision measuring instruments including the use of tool tools, hacksaws, drilling machines, and making work flow based on working drawings and make it happen*)

MES1.52.1012 Matematika (Mathematics) 2 SKS

Memberikan pengetahuan tentang: konsep-konsep matematika dasar seperti bilangan, pemfaktoran, perpangkatan dan eksponen, deret, sistem koordinasi, trigonometri, fungsi dan himpunan, matrik, vektor dan logaritma. Daftar bacaan : Matematika untuk teknik, K. Stroud. Kalkulus, Purcell
(*Providing knowledge about: basic mathematical concepts such as numbers, factoring, rows and exponents, series, system coordination, trigonometry, functions and sets, matrices, vectors and logarithms*)

MES1.52.1013 Kimia Terapan (Applied Chemistry) 2 SKS

Memberikan pengetahuan tentang: materi, stoikiometri, teori atom, struktur atom, ikatan atom, larutan, reaksi redoks, elektro kimia, thermokimia, peranan bahan kimia di bidang teknik, Kolorimetri, Spektrofotometri *infra-red, Mass Spectroscopy,* Fluorometri, Analisis sampel. Daftar Bacaan Hiskia Achmad, Tupamahu, (1988). Struktur Atom; Struktur Molekul; Sistem Periodik. MIPA ITB. Hoop Vollrath, (1985). Dasar-Dasar Teknologi Kimia. Hoechst: Indonesia. Keenan, Kleinfelter, Wood, Pudjaatmaka A. Hadyana, (1999). Ilmu Kimia Untuk Universitas, Edisi VI Jilid 1 dan 2. Penerbit Erlangga: Jakarta. Keith J, Laidler, (1966). Principles of Chemistry. Harcourt, Brace and World, Inc. New York/Chicago/Burlingame. PEDC, (1982). Kimia. PEDC: Bandung. Petrucci Ralph H, Ahmadi Suminar, (1992), Kimia Dasar: Prinsip dan Terapan Modern, Edisi IV Jilid 1, 2, dan 3. Penerbit Erlangga: Jakarta, Prasojo, S.L. 2010. Kimia Organik Jilid I, Sukimo. 2009. Organic Chemistry an introductory course in organic
(*Provides knowledge of: materials, stoichiometry, atomic theory, atomic structure, atomic bonds, solutions, redox reactions, electrochemistry, thermochemistry, chemical role in engineering, colorimetry, infrared spectrophotometry, mass spectroscopy, fluorometry, sample analysis.*)

MES1.52.2010 Fisika Terapan (Applied Physics) 3 SKS

Kemampuan mengaplikasikan konsep dan prinsip fisika yang mempelajari tentang pengukuran, besaran dan satuan, vektor, kinematika, dinamika, usaha dan energi, momentum dan tumbukan, dinamika rotasi, kesetimbangan dan titik berat, fluida statis, fluida dinamis, kalor, thermodinamika, yang merupakan ilmu yang menjadi dasar untuk menjelaskan fenomena fisis dan menjadi dasar pada matakuliah keteknikan. Daftar bacaaan: Searz Zemansky, "Fisika Universitas", (1992), Hugh D. Young & Roger A. Freedman, "Fisika Universitas", Ed. Kesepuluh, Erlangga, (2002), Nolan, Peter J., 1993, "Fundamentals of College Physics, Wm. C. Brown Publisher, Melbourne, Australia, Giancoli, Douglas C, "Physics for Scientist and Engineers", 2nd Ed., Prentice Hall, 1998. (Fisika, Jilid 1, edisi Terjemahan Erlangga Jakarta), Fisika Untuk Insinyur, Schaum Series, The Mc Graw Hill Companies,1999
(*Ability to apply physical concepts and principles about measurement, quantities and units, vectors, kinematics, dynamics, effort and energy, momentum and collisions, dynamics, rotation, equilibrium and center of gravity, statistical fluid, dynamic fluid, heat, thermodynamics, which require knowledge becomes the basis for explaining physical phenomena and becomes the basis for engineering courses.*)

MES1.52.2011 Matematika Terapan (Applied Mathematics) 2 SKS

Memberikan pengetahuan tentang konsep-konsep dasar matematika dan penerapannya dalam teknik mesin menggunakan Aljabar, trigonomgetri (geometri), logaritma, diferensial, integral, Fungsi dan matrik, Fungsi Kompleks yang meliputi bilangan kompleks dan operasinya, bentuk baku dan bentuk kutub, bentuk logarima dan eksponensial, bentuk kuadrat dan akar kuadrat, teorema deMoivre dan bentuk trigonometri; Persamaan Diferensial orde pertama dan orde kedua, penyelesaian persamaan diferensial dengan cara integrasi, substitusi, dan Bernoulli; Matriks, metode matriks ajoint dan eliminasi Gauss dalam menyelesaikan sistem persamaan linier, nilai eigen, vector eigen. Daftar Bacaan Kastroud., (1987), Matematika untuk Teknik, Jakarta : Penerbit Erlangga. Bill Cox (2001), Understanding Engineering Mathematic, Great Britain, MPG Books Ltd. Bodmin, Cornwall
(*Providing knowledge about basic mathematical concepts and their application in mechanical engineering using Algebra, trigonomgetri (geometry), logarithms, differentials, integrals, functions and matrices, complex functions which include complex numbers and their operations, standard forms and polar forms, logarimic and exponential forms , the form of square and square root, deMoivre theorem and trigonometric form; First-order and second-order differential equations, solving differential equations by means of integration, substitution, and Bernoulli; Matrix, ajoint matrix method and Gauss elimination in solving systems of linear equations, eigenvalues, eigenvectors.*)

MES1.52.2012 Gambar Mesin (Mechanical Drawing) 2 SKS

Memberikan pengetahuan dan pemahaman tentang : Ulir M, W, P, G,O, (Butteres, Mur, Baut, ulir dalam, ulir luar, batas ulir, sudut, ulir terpasang, ulir terpotong; Rantai, bantalan luncur dan peluru, paku keling dan pegas; Geometrik perpotongan (garis istimewa); Gambar bukaan/Bentangan dari : kerucut tegak dan miring terpancung, limas tegak dan miring terpancung, bujur sangkar/segi empat, silinder, Transformer. Daftar Bacaan Giachino. (1966). Drafting Technology. American. American Technical Society, Chicago, Illinois. Mazni Sutan Tumanggung .(1983). Menggambar Bentangan (Depelovment). Padang. FPTK-IKIP Padang. Mazni Sutan Tumanggung. (1985). Menggambar Mesin Bentangan. Padang. FPTK-IKIP Padang. Ostrowsky, BA. MSE P Eng. (1981). Engineering Drawing For Technicians. London. ELBS. Parkinson. (1961). Intermediate Engineering Drawing. London. Sir Isaac & Sons, Ltd. Rhodes, L.B. Cook. (1978). Basic Engineering Drawing . Melbourne. Pitman Publishing Ltd. Sugiarto N.H. (1987). Menggambar Mesin menurut ISO. Jakarta. Pradnya Paramita.
(*Provide knowledge and understanding of: Thread M, W, P, G, O, (Butteres, Nuts, Bolts, inner threads, outer threads, thread limits, angles, threads attached, threaded threads; Chains, sliding bearings and bullets, rivets and spring; intersecting geometric (special line); image of openings / stretches of: upright cones and angled slopes, upright limas and angled slopes, squares / rectangles, cylinders, transformers*)

MES1.52.2013 Dasar Pemrograman Komputer (Computer Programming Basic) 2 SKS

Memberikan pengetahuan tentang: Hardware, software, dan brainware; prinsip pemrograman menurut logika dan algoritma yang betul; Struktur bahasa pemrograman Basic, Pascal, C, C++, Java yang memuat tentang Pengulangan, penyeleksian kondisi, variabel array; Procedure dan function; Rekursi; Record dan Fill; mengaplikasikan ke penyeleksian Teknik Mesin. Daftar Bacaan: Jogiyanto, H.M., (1995) Toeri Dan Aplikasi Program Komputer Bahasa Pascal. Andi Offset: Yogyakarta. Nugroho, Eko, (1993) Bahasa Pemrograman Pascal. Andi Offset: Yogyakarta. Konvaline, John, (1994) Programming with Pascal. Mc Graw Hill: New York
(*Providing knowledge about: Hardware, software, and brainware; correct programming and logic principles; Structure of Basic, Pascal, C, C ++, Java programming languages ??that contain repetition, selection of conditions, array variables; Procedure and function; Recursion; Record and Fill; apply to selecting Mechanical Engineering.*)

MES1.52.2014 Teknik Pembentukan Logam (Sheet Metal Forming) 3 SKS

Memberikan pengetahuan tentang: pengerjaan besi plat (lembaran), meliputi: pekerjaan pemotongan, pembentukan dan penyambungan. Pekerjaan pemotongan dengan cara manual (gunting tangan, pahat tangan, guillotine pedal) dan mesin (guillotine machine) sampai penggunaan teknik las (las listrik dan asetilin). Pekerjaan pembentukan, meliputi: teknik bending, rolling, blanking, stiffening, drawing. Proses penyambuangan, meliputi pembuatan sambungan lipat, solder, las (listrik, asetilin), paku keling (biasa dan pop rivet), mur dan baut. Kegiatan praktek diarahkan dalam bentuk aplikasi materi pengajaran terhadap pembuatan produk benda terpakai dan tepat guna. Daftar Bacaan Buku-buku yang relevan
(*Provide knowledge about: work on iron plates (sheets), including: cutting, forming and connecting work. Cutting works by manual (hand scissors, hand tools, guillotine pedals) and guillotine machines to the use of welding techniques (electric welding and acetylene). Formation work, including: bending, rolling, blanking, stiffening, drawing techniques. The disassembly process includes making folding connections, solder, welding (electricity, acetylene), rivets (ordinary and pop rivets), nuts and bolts. Practice activities are directed in the*

form of application of teaching materials to the making of used and appropriate objects.)

MES1.52.2015 Teknologi Pemesinan (Machining Technology) 3 SKS

Memberikan pengetahuan tentang: dasar-dasar dan tatacara pengoperasian mesin-mesin perkakas pengerjaan logam seperti mesin bor, bubut, sekrap, slot, frais, gerinda, batu gerinda dan penggunaannya, alat potong dan cairan pendingan, mesin perkakas non-konvensional seperti electrical discharge, electrochemical, chemical, ultrasonic, electron beam, dan laser beam machining, serta proses pengerjaan mesin lainnya. Daftar Bacaan Repp, Victor E. (1984). Machine Tool Technology. McKnight Publishing Company. Bloomington, Illinois.
(*Providing knowledge about: the basics and procedures for the operation of metalworking machinery such as drilling machines, lathes, scrap, slots, mills, grinders, grinding stones and their use, cutting tools and cooling fluids, non-conventional machine tools such as electrical discharge, electrochemical, chemical, ultrasonic, electron beam, and laser beam machining, as well as other machining processes.*)

MES1.52.2016 Teknik Listrik dan Elektronika Dasar (Electrical and Basic Electronics Engineering) 2 SKS

Memberikan pengetahuan tentang konsep listrik DC Cahaya (perambatan cahaya dan alat optik serta penerangan), Arus Listrik Searah (rangkaian tahanan, hukum-hukum dasar rangkaian DC, energi dan daya listrik), Medan Magnit oleh Arus Listrik (arah dan besar kuat medan magnit oleh arus DC pada kawat lurus dan kawat bergulung, dasar motor listrik/Gaya Lorentz, transformator), Arus Bolak-Balik Satu Fase (pembangkitan, beban listrik, daya, dan faktor daya), Arus Bolak-Balik Tiga Fase (pembangkitan, sambungan bintang dan sambungan segitiga), Dasar-Dasar Elektronika (semi konduktor, dioda, transistor).
(*Providing knowledge about the concept of DC electricity Light (propagation of light and optical devices and lighting), Direct Electric Current (resistance circuit, basic DC circuits, energy and electric power), Field Magnitude by Electric Current (direction and magnitude of the magnetic field by DC current in straight wire and rolled wire, base of electric motor / Lorentz force, transformer), Alternating Current One Phase (generation, electric load, power, and power factor), Three Phase Alternating Current (generation, star connection and triangular connection), Electronics Basics (semi conductors, diodes, transistors).*)

MES1.52.3009 Mekanika Teknik (Engeneering Mechanics) 3 SKS

Memberikan pengetahuan tentang ilmu mekanika yang dapat diterapkan pada bidang teknik mesin dalam menyelesaikan mekanika teknik resultan gaya dua dimensi, komponen gaya dua dimensi, resultan gaya tiga dimensi, komponen gaya tiga dimensi, statika partikel dua dimensi, momen dan kopel, sistem tumpuan, analisis tegangan dan regangan, Hukum Hooke, reaksi tumpuan, gaya geser dan momen bengkok pada beban titik, analisis reaksi tumpuan, gaya geser dan momen bengkok pada beban terpusat dan beban terbagi rata, analisis struktur sederhana, analisis gaya pada batang dan balok, titik berat penampang, momen lembam linier penampang, dalil pergeseran, tahanan momen lembam linier dan polar, momen bengkok, momen puntir, momen ideal.
(*Giving knowledge about mechanics that can be applied to the field of mechanical engineering in solving the mechanics of resultant two-dimensional forces, two-dimensional force components, resultant three-dimensional forces, three-dimensional force components, two-dimensional particle statics, moments and couplings, pedestal systems, stress analysis and strain, Hooke's law, support reactions, shear forces and bent moments at point loads, analysis of support reactions, shear forces and bent moments in centralized loads and evenly divided loads, simple structural analysis, force analysis on rods and beams, cross section weight points, linear inert moments cross section, proposition shift, resistance to linear and polar inert moments, bent moments, twisting moments, ideal moments.*)

MES1.52.3010 Thermodinamika (Thermodynamics) 2 SKS

Memberikan pengetahuan tentang: Konsep Dasar Thermodinamika, Kerja, Panas, dan Pembakaran, Hukum I Thermodinamika, Perubahan keadaan, Entropy dan Hukum II Thermodinamika, Sifat-sifat Zat Murni dan Siklus pada Mesin-mesin Panas.
(*Providing knowledge about: Basic Concepts of Thermodynamics, Work, Heat, and Combustion, Law I Thermodynamics, Changes in circumstances, Entropy and the Law of Thermodynamics II, Properties of Pure Substances and Cycles on Hot Machines.*)

MES1.52.3011 Kinematika dan Dinamika (Kinematics and Dynamics) 2 SKS

Mengaplikasikan konsep dasar kinematika mesin dan dinamika, kecepatan dan percepatan, vektor, gerak relatif dan absolut dengan percepatan normal dan tangensial, pusat kecepatan dan percepatan sesaat, gerak translasi dan rotasi, mekanisme rangkaian batang penghubung, sistem mekanik yaitu linkage dan macam-macam sistem roda gigi, Mekanisme nok, analisis poligon kecepatan dan percepatan pada mekanisme komplek, sintesis kinematik linkage, analisis gaya inertia, penyeimbang massa-massa berputar. Daftar Bacaan Ramses Y.H. (2006), Mekanisme dan Dinamika Mesin, Andi Offset, Yogyakarta;
(*Applying the basic concepts of engine kinematics and dynamics, speed and acceleration, vectors, relative and absolute motion with normal and tangential accelerations, centers of instantaneous speed and acceleration, translational and rotational motion, connecting rod circuit mechanisms, mechanical systems namely linkage and various wheel systems teeth, the mechanism of the nok, the analysis of speed and acceleration polygons in complex mechanisms, linkage kinematic synthesis, inertia force analysis, counterweight of rotating masses. Ramses Y.H's Reading List (2006), Mechanism and Engine Dynamics, Andi Offset, Yogyakarta;*)

MES1.52.3012 Mesin Konversi Energi (Energy Conversion Machine) 2 SKS

Memberikan pengetahuan tentang: energi dan cadangan energi, prinsip dasar mesin konversi energi, motor bakar, motor bensin, motor diesel, turbin uap dan turbin gas, Rekayasa kincir air, kincir angin dan mekanisme penggerak.
(*Provides knowledge about: energy and energy reserves, the basic principles of energy conversion, fuel motors, gasoline motors, diesel motors, gas and gas turbines, turbines, windmills and drive drivers.*)

MES1.52.3013 Teknologi dan Pengujian Bahan (Technology and Testing of Materials) 3 SKS

Memberikan pengetahuan tentang : bahan teknik khususnya logam, polimer dan komposit, sifat-sifat bahan, dasar metalografis dengan diagram fase, perlakuan panas baja, ikatan atom dan struktur logam, pengujian logam, pengolahan, pemakaian dan standar bahan (material) praktikum.
(*Provide knowledge about: engineering materials especially metals, polymers and composites, properties of materials, metallographic bases with phase diagrams, steel heat treatment, atomic bonds and metal structures, metal testing, processing, usage and standard practicum material.*)

MES1.52.3014 Metrologi Industri (Industrial Metrology) 3 SKS

Memberikan pengetahuan dalam menguasai dan memahami metrologi,prinsip-prinsip pengukuran, kontrol kualitas, konsep Standar ISO , konstruksi Alat Ukur, Alat dan Metode Pengukuran, Prosedur Kalibrasi, Penggunaan alat ukur standar dan kaliber,Pengukuran Kekasaran Permukaan, Toleransi dan Suaian, serta penggunaan alat-alat ukur di industri permesinan secara benar.
(*Providing knowledge in mastering and understanding metrology, measurement principles, quality control, ISO Standard concepts, construction of Measuring Instruments, Measurement Tools and Methods, Calibration Procedures, Use of standard and caliber measuring instruments, Surface Roughness Measurement, Tolerance and Suication, and tool use measuring instruments in the machinery industry correctly.*)

MES1.52.3015 Teknologi Pengelasan Logam (Metal Welding Technology) 3 SKS

Memberikan pengetahuan dan keterampilan tentang pengelasan dengan menerapkan teknik dan prosedur pengelasan dalam berbagai jenis konstruksi sambungan las, dengan menggunakan proses las Busur Listrik pada logam.
(*Provide welding knowledge and skills by applying welding techniques and procedures in various types of welded joint construction, using the Electric Arc welding process on metal.*)

MES1.52.3016 Teknologi Mesin Perkakas (Machining Tools Technology) 3 SKS

Memberikan pengetahuan tentang: dasar-dasar dan tata cara pengoperasian mesin-mesin perkakas pengerjaan logam seperti mesin bor, bubut, sekrap, slot, frais, gerinda, batu gerinda dan penggunaannya, alat potong dan cairan pendingin, mesin perkakas non-konvensional seperti electrical discharge, electrochemical, chemical, ultrasonic, electron beam, dan laser beam machining, serta proses pengerjaan mesin lainnya.
(*Provide knowledge about: the basics and procedures for operating metalworking machinery such as drilling machines, lathes, scrap, slots, mills, grinders, grinding stones and their use, cutting tools and coolants, non-conventional machine tools such as electrical discharge , electrochemical, chemical, ultrasonic, electron beam, and laser beam machining, as well as other machining processes.*)

MES1.52.4009 CAD & CAM (Computer Aided Design And Computer Aided Manufacturing) 2 SKS

Memberikan pengetahuan tentang menggambar menggunakan software CAD/CAM, dimana CAD 2D& 3D, Setting Drawing Editor, Drawing Construction commands, Modify Commands, Texts and dimension, Format Commands, Solid Commands, Solid Editing, Formating View tools, Printing.Menggambar CAM merupakan teknologi perencanaan, pengaturan, dan pengontrolan pembuatan produk dengan bantuan komputer.
(*Providing knowledge about drawing using CAD / CAM software, where 2D & 3D CAD, Drawing Editor Settings, Drawing Construction commands, Modify Commands, Texts and dimensions, Format Commands, Solid Commands, Solid Editing, Formatting View tools, Printing. Drawing CAM is planning technology , setting up, and controlling the manufacture of products with the help of computers.*)

MES1.52.4010 Elemen Mesin (Machine Elements) 2 SKS

Memberikan pengetahuan tentang konsep dasar perencanaanperhitungan elemen mesin dalam pembuatan alat, analisa tegangan dan teori kegagalan, kekuatan statis bagian-bagian mesin, perhitungan perencanaan sambungan kopling (couplings), paku keling, baut dan las, perhitungan poros dan gandar (shaft and Axel), pasak, spline, pemidah daya (transmisi) dengan sabuk (belt) dan puli, pegas, roda gigi. Daftar Bacaan: Sularso, Kiyokatsu Suga, 2004, Dasar Perencanaan dan Pemilihan Elemen Mesin, Edisi Kesebelas Pradnya Paramita Jakarta
(*Providing knowledge about the basic concepts of planning for calculating machine elements in making tools, stress analysis and failure theory, static strength of engine parts, calculation of couplings, rivets, bolts and welds, shaft and axel calculations, stake, spline, transfer of power (transmission) with belt (belt) and pulleys, springs, gears.*)

MES1.52.4011 Mekanika Fluida (Fluid Mechanics) 2 SKS

Memberikan pengetahuan tentang: konsep aliran dan sifat-sifat Fluida, Tekanan Statis dan alat-alat Ukur tekanan Fluida, Gaya Hidrostatis, Hukum Kontinuitas dan Persamaan Bernouli, Alat-alat ukur Aliran Fluida, Aliran Fluida dalam Pipa, Momentum Pancaran, Mesin-mesin Fluida.
(*Provides knowledge about: the concepts of flow and fluid properties, static pressure and fluid pressure measuring devices, hydrostatic force, continuity law and Bernouli equations, fluid flow meters, fluid flow in pipes, luminous momentum, fluid machines .*)

MES1.52.4012 Mekatronika (Mechatronics) 2 SKS

Memberikan pemahaman danpengetahuan peranan produk mekatronikadiduniaindustri serta aplikasinya, sistem bilangan, cara melakukan transformasi antar sistem bilangan serta cara perhitungannyadengan kontrol industri yang meliputi dasar-dasar elektronik, ditital, relay, counter, timer, motor & sensor dan prinsip-prinsip temperatur control, Programmable logic control yang meliputi komponen dasar PLC pemprogram dengan diagram tangga, robotika, kinematika dan dinamika robot.
(*Providing an understanding and knowledge of the role of mechatronics products in the industry and its applications, number systems, how to transform between number systems and how to calculate them with industrial controls which include electronic, digital, relay, counter, timer, motor & sensor and temperature control, programmable logic control which includes the basic components of the PLC programmed with ladder diagrams, robotics, kinematics and robot dynamics.*)

MES1.52.4013 Fenomena Dasar Mesin (Machine Basic Phenomena) 2 SKS

Mata kuliah ini membahas dan menganalisis gaya-gaya pada batang: rangka batang, gaya geser pada batang dan buckling (tekuk). Analisis aliran fluida air, seperti: gesekan aliran pada pipa, venturi meter, koefisien orifis, pembesaran mendadak dan momentum pancaran fluida pada berbagai bidang (datar, miring, dan cekung). Slotted link (mekanisme kembali cepat. Analisis kerusakan bahan, seperti: deflection test (defleksi) dan torsion (torsi). Transmisi roda gigi dan putaran kritis.
(*Provide knowledge in analyzing the forces on the stem: trunk frame, shear force on the stem and buckling (bending). Analysis of fluid flow, such as: flow friction in pipes, venturi meters, orifice coefficients, sudden enlargement and momentum of fluid rays in various fields (flat, sloping, and concave). Slotted link (mechanism returns quickly). Analysis of damage to materials, such as: deflection test (deflection) and torsion. Transmission of gears and critical rotation.*)

MES1.52.4014 Mesin Teknologi Terapan ((Applied Machine Technology)) 2 SKS

Memberikan pemahaman konsep mesin, teknologi dan penerapan dengan sumber daya energi, memanfaatkan energi yang ada disekitar dan terbarukan. Pemanfaatan energi matahari untuk pengering (kopi, daun tembakau, dsb.). Pemanfaatan energi air untuk pembangkit energi sederhana. Teknologi pompa penggerak sendiri (self action pump). Teknlogi industri kecil (rumah tangga). Konsep pembuatan tungku sederhana dengan bahan bakar sekam, bahan bakar serbuk kayu. Prinsip pembuatan bahan bakar melalui proses gasifikasi. Pemanfaatan bahan bakar dari sampah organik. Proses pembuatan Biogas. Menampung kreatifitas dan inovasi mahasiswa tentang teknologi tepat guna dalam bentuk konsep perencanaan (perhitungan dan gambar); perancangan prototipe atau perancangan peralatan / mesin-mesin pertanian.
(*Providing an understanding of the concepts of machinery, technology and application with energy resources, utilizing existing and renewable energy. Utilization of solar energy for dryers (coffee, tobacco leaves, etc.). Utilization of water energy for simple energy generation. Own drive pump technology (self action pump). Small-scale industry (household) technology. The concept of making simple stoves with husk fuel, wood powder fuel. The principle of making fuel through the gasification process. Utilization of fuel from organic waste. The process of making biogas. Accommodate student creativity and innovation about appropriate technology in the form of planning concepts (calculations and drawings); designing prototypes or designing equipment / agricultural machinery.*)

MES1.52.4015 Pemograman CNC (CNC Programming) 3 SKS

Memberikan pengetahuan tentang: Dasar pengoperasian dan pemogramanc pada mesin perkakas CNC, sistem persumbuan, tool offset, titik referensi, fungsi-fungsi miscellaneaus standar, Kode M dan kode G untuk interpolasi linear, melingkar, siklus pembubutan memanjang, melintang, penguliran, alur, bor, siklus pengefraisan kantong, serta pembuatan sub program (sub rutin)
(*Providing knowledge about: Basic operation and programming of CNC machine tools, chain systems, offset tools, reference points, standard miscellaneaus functions, Code M and G codes for linear, circular interpolation, longitudinal, transverse, rolling, grooving, drill turning cycles , pocket bagging cycle, and making sub-programs (sub-routine)*)

MES1.52.4016 Pemeliharaan Mesin (Machine Maintenance) 3 SKS

Memberikan pengetahuan dan keterampilan dalam mengidentifikasi jenis kerusakan pada mesin-mesin perkakas pengerjaan logam, pengaturan kinerja mesin yang meliputi teknik leveling, pengaturan kelurusan sumbu mesin, pemeriksaan, perbaikan dan pembuatan komponen-komponen mesin, dan optimalisasi kondisi mesin secara keseluruhan. Konsep organisasi, perencanaan, prosedur pemeliharaan mesin (perencanaan, tak berencana, preventif, break down, dan shut down). Praktek pemeliharaan, diagnosa logika, waktu menemukan kesalahan, membuktikanbagian yang salah, sistem dan symbol-simbol pelumasan, kelistrikan, oli, gemuk, kontruksi mesin dan seal.
(*Provide knowledge and skills in identifying the types of damage to metalworking machinery, regulating engine performance which includes leveling techniques, adjusting the axis alignment of the engine, checking, repairing and manufacturing engine components, and optimizing overall engine conditions. The organization concept, planning, machine maintenance procedures (planning, not planning, preventive, break down, and shut down). Maintenance practices, logic diagnostics, time to find errors, prove wrong parts, systems and symbols of lubrication, electricity, oil, grease, machine construction and seals.*)

MES1.52.5007 Teknik Pendingin (Refrigeration and Air Conditioning) 2 SKS

Memberikan pengetahuan tentang analisis dan disain sistem pendingin, disain instalasi refrigerasi, penentuan bahan, kapasitas refrigerasi dan kebutuhan energi peralatan refrigerasi. Sistem pendinginan yang dicakup adalah: kompresi uap, sistem absorpsi dan termoelektrik dengan aplikasi pada pengkondisian udara, pembekuan dan penyimpanan dingin.
(*Provide knowledge about the analysis and design of cooling systems, design of refrigeration installations, determination of materials, refrigeration capacity and energy requirements of refrigeration equipment. The cooling systems included are: vapor compression, absorption and thermoelectric systems with applications to air conditioning, freezing and cold storage.*)

MES1.52.5008 Instalasi Pabrik (Lay Out of Factory) 2 SKS

Memberikan pengetahuan tentang: Perencanaan instalasi pabrik, manfaat dari perencanaan suatu instalasi dari sebuah pabrik, baik skala kecil dan maupun besar. Dilanjutkan dengan pendahuluan (tujuan instalasi, syarat instalasi, prosedur instalasi), pengantar algining, leveling, balancing, perencanaan biaya instalasi, penjadwalan biaya instalasi, perancangan alat bantu instalasi, instalasi pompa, intalasi kompresor, instalasi mesin tenaga, instalasi mesin pendingin, instalasi pemipaan, instalasi ketel uap, instalasi alat pencegah kebakaran, tata letak pabrik, perencanaan jumlah mesin dengan luas area, tipe tata letak pabrik, alat pemindah bahan dan pergudangan
(*Provide knowledge about: Planning plant installation, the benefits of planning an installation from a factory, both small and large scale. Followed by introduction (installation objectives, installation requirements, installation procedures), introduction to algining, leveling, balancing, installation costs planning, installation costs, design of installation aids, pump installation, compressor installation, power machinery installation, cooling machine installation, piping installation , steam boiler installation, fire suppression installation, factory layout, planning the number of machines with area, plant layout type, material transfer equipment and warehousing*)

MES1.52.5009 Hidrolik dan Pneumatik (Hydraulics and Pneumatics) 2 SKS

Memberikan pengetahuan tentang konsep kontrol di industri, hidrolik, aliran fluida dan persamaannya, peralatan hidrolik, rangkaian pada sistem hidrolik, penerapan sistem pneumatik dan hidrolik di industri, pengantar pneumatik, media dan distribusinya, symbol dan mekanisme komponen, pengembangan sirkuit diagram, konflik sinyal, trouble shooting dan perawatan, pengantar kontrol hidrolik, pengembangan sirkuit diagram hidrolik, dan perencanaan aplikasi. peralatan pneumatik, rangkaian pada sistem pneumatik,
(*Provides knowledge of industrial control concepts, hydraulics, fluid flow and similarities, hydraulic equipment, circuits in hydraulic systems, application of pneumatic and hydraulic systems in industry, pneumatic introduction, media and distribution, symbol and component mechanisms, circuit diagram development, signal conflict, trouble shooting and maintenance, introduction to hydraulic control, circuit development for hydraulic diagrams, and application planning. pneumatic equipment, circuits on pneumatic systems,*)

MES1.52.5010 Manajemen Proyek dan Industri (Project and Industrial Management) 2 SKS

Memberikan pengetahuan tentang manajemen/pengelolaan proyek di industri, tahapan implementasi dalam mengembangkan suatu ide produk sampai menjadi suatu industri, sistem produksi, pengorganisasian kegiatan produksi, tugas manajemen produksi dan tantangan meningkatkan produktifitas, analisis dan optimasi sistem produksi pengertian produk dan rancangan dan pengembangan produk, aspek lokasi dan tata letak, perencanaan proses dan pengukuran kerja, estimasi biaya produksi dan analisis pasar, pengendalian persediaan, pemindahan bahan dan distribusi, pengendalian kualitas dan reliabilitas produk, permasalahan pemeliharaan dan penggantian alat.
(*Providing knowledge about project management / management in the industry, implementation stages in developing a product idea until it becomes an industry, production systems, organizing production activities, production management tasks and challenges in increasing productivity, analysis and optimization of production systems understanding products and product design and development, location and layout aspects, process planning and work measurement, estimation of production costs and market analysis, inventory control, material transfer and distribution, quality control and product reliability, maintenance issues and equipment replacement.*)

MES1.52.5011 Bahasa Inggris Teknik (Engineering English) 2 SKS

Memberikan pengetahuan dan keterampilan dalam mengkomunikasikan dalam bahasa inggris persoalan keteknikan dengan baik dalam bentuk lisan dan tulisan, serta mempunyai kemampuan yang cukup untuk membaca dan memahami buku- buku teks keteknikan dalam bahasa inggris dengan baik. Kegiatan mendengar melibatkan mahasiswa untuk mendengarkan dan menjelaskan isi suatu teks yang dibacakan, baik secara langsung oleh narasumber, maupun melalui pemutaran kaset audio. Aktifitas mengucapkan berupa melatih mahasiswa agar mampu melakukan kominiasi lisan dalam Bahasa Inggris untuk beberapa situasi yang relevan dengan kebutuhan di masa datang.
(*Providing knowledge and skills in communicating in English the issue of engineering both in oral and written form, and has sufficient ability to read and understand technical textbooks in English well. The listening activity involves students to listen and explain the contents of a text that is read, both directly by the speakers, as well as through the playback of audio cassettes. Speech activities include training students to be able to communicate verbally in English for a number of situations that are relevant to future needs.*)

MES1.52.5012 Tata Tulis Karya Ilmiah dan Seminar (Scientific Writing Guide and Seminars) 2 SKS

Memberikan pengetahuan dan keterampilan tentang penulisan dan penyusunan laporan ilmiah (proyek akhir) secara baik dan efektif sesuai dengan tata aturan dan kaidah ilmiah.
(*Provide knowledge and skills about writing and preparing scientific reports or final projects in a good and effective manner in accordance with the rules and scientific rules.*)

MES1.52.5013 Praktek Industri (Industrial Experience) 3 SKS

Mata kuliah ini memberikan pemahaman dan pengetahuan dalam menerapkan keilmuan teknik mesin yang telah di peroleh selama perkuliahan pada aktifitas di industri sebagai pengembangan kepribadian
(*provide understanding and knowledge in applying the science of mechanical engineering that has been obtained during lectures on activities in the industry as personality development*)

MES1.52.6002 Proyek Akhir (Final Project) 4 SKS

Menerapkan ilmu yang di peroleh selama perkuliahan dengan merancang bangun suatu mesin/alat yang bermanfaat bagi masyarakat yang bernuansa teknologi
(*Applying the knowledge gained during lectures by designing a machine / tool that is beneficial to the community that has technological*

nuances)

MES2.52.4007 Teknologi Proses Permesinan (Machining Process Technology) 2 SKS

Memberikan pengetahuan tentang: klasifikasi dan elemen dasar produksi permesinan, mekanisme pembentukan tatal, geometri pahat, temperatur pemotongan dan keausan pahat, umur pahat, material pahat dan sistem kelengkapan perkakas, optimasi proses permesinan, proses gerinda, dan cairan pendingin.
(*Provides knowledge about: classification and basic elements of machining production, tatal formation mechanism, tool geometry, cutting temperature and tool wear, tool life, tool material and tooling system, optimization of machining processes, grinding process and coolant*)

MES2.52.4008 Teknik Pengarah dan Penepat (Jig and Fixture Engineering) 2 SKS

Memberikan keterampilan tentang : dasar-dasar perancangan perkakas bantu proses manufactur, efesiensi proses produksi (efficient production),rencana produksi (production planning),ergonomis, produksi massal (Mass Production), penjaminan kualitas produk (quality control), ergonomis.
(*Provide skills about: the basics of designing auxiliary tools manufacturing processes, efficiency of production processes, production planning, ergonomics, mass production, product quality assurance, ergonomics.*)

MES2.52.4009 Pesawat Angkat ((Elevate Equipment)) 2 SKS

Memberikan pengetahuan tentang peralatan pemindahan bahan yang meliputi crane, pully system, sprocket and drum, hoisting crane, jib crane lifter, fork lift, excavator, lift, belt conveyor, bucket elevator, pneumatic and hydraulic, serta alat-alat berat.
(*Providing knowledge about material transfer equipment including cranes, system pulleys, sprocket and drums, hoisting cranes, crane lifter jibs, lift forks, excavators, elevators, conveyor belts, bucket elevators, pneumatic and hydraulic, and heavy equipment.*)

MES2.52.4010 Rekayasa Berbantuan Komputer (CAE) (Computer Aided Engineering) 2 SKS

Memberikan pengetahuan dan keterampilan tentang rekayasa berbantuan komputer menggunakan software berbasis computer-aided engineering (CAE) dalam menyelesaikan persoalan-persoalan seperti analisis, simulasi, desain, perencanaan, diagnosis dan perbaikan dibidang teknik mesin.
(*Providing knowledge and knowledge about computer-assisted engineering using computer-aided engineering (CAE) -based software in completing analyzes, simulations, designs, planning, diagnosis and improvements in the field of mechanical engineering.*)

MES2.52.4011 Teknologi Proses Fabrikasi (Fabrication Process Technology) 2 SKS

Memberikan pengetahuan dalam merencanakan produk tepat guna yang dirancang bangun dengan desain, analisis, pemilihan bahan, alat bantu pengerjaan, proses pengerjaan, system perakitan, uji unjuk kerja produk. Analisis aplikasi teknik pengelasan dan prosedur pengelasan Menghitung RAB yang digunakan dalam pembuatan sebuah produk.
(*Provide knowledge in planning appropriate products that are designed to build with design, analysis, material selection, work tools, work processes, assembly systems, product performance tests. Analysis of application of welding techniques and welding procedures Calculate the RAB used in making a product.*)

MES2.52.4012 Las MIG dan TIG (MIG and TIG Welding) 2 SKS

Memberikan pengetahuan dan keterampilan penggunaan mesin las MIG dan TIG dengan Prinsip dan prosedur Las Oxy Asitelin TIG dan MIG. Pengelasan sambungan T dan Sambungan Pipa dengan berbagai Posisi pengelasan menggunakan las Oxy Asitelin TIG dan MIG. Membuat rancangan dan Metode demontrasi pembelajaran proses Las Oxy Asitelin TIG dan MIG.
(*Provide knowledge and skills for using MIG and TIG welding machines with the TIG and MIG Las Oxy Asitelin Principles and procedures. Welding T connections and pipe joints with various welding positions using Oxy Asitelin TIG and MIG welds. Make a design and method for demonstration of the learning process of the Las Oxy Asitelin TIG and MIG*)

MES2.52.5007 Teknologi Produksi Permesinan (Machining Production Technology) 3 SKS

Memberikan pengetahuan tentang : Rancang bangun mandrel lurus, Rancang bangun gigi rack, Rancang bangun roda gigi lurus, Rancang bangun roda gigi lurus differential, Rancang bangun roda gigi tirus/payung, Rancang bangun roda gigi cacing dan ulir cacing, Rancang bangun roda gigi helix, Rancang bangun reducer, Rancang bangun gear box, Gerinda datar, Gerinda silindris, Gerinda tool.
(*Provide knowledge about: Mandrel straight design, gear rack design, design of straight gear, design of differential straight gear, design of taper gear / umbrella, design of worm gears and threaded worms, design of helix gears, Build reducer, design gear box, flat burrs, cylindrical burrs, tool burrs.*)

MES2.52.5008 Teknik Produksi dan Pemograman NC (Production Engineering and NC Programming) 3 SKS

Memberikan pengetahuan tentang: teknik dan praktek mesin perkakas NC/CNC, meliputi: pemograman bubut, frais, dan pemograman makro, latihan CTS, CAD/CAM, ET dan VMC, otomasi proses manufaktur, perencanaan kerja, teknologi kelompok, sistem control spindel kode EIA dan ASCII, Mikroprocessor & Memory (I/O), Automatic Tool Changer (ATC), Automatic Pallet Changer (APC), CTS industri, CAD/CAM, Flexible Manufacturing System (FMS), Integreted Manufacturing Production Sistem (IMPS), pemograman bubut dan frais, dan pemograman makro.
(*Providing knowledge about: techniques and practices of NC / CNC machine tools, including: lathe programming, milling, and macro programming, CTS training, CAD / CAM, ET and VMC, manufacturing process automation, work planning, group technology, EIA code spindle control system and ASCII, Microprocessor & Memory (I / O), Automatic Tool Changer (ATC), Automatic Pallet Changer (APC), industrial CTS, CAD / CAM, Flexible Manufacturing System (FMS), Integreted Manufacturing Production System (IMPS), lathe*

programming and milling, and macro programming.)

MES2.52.5009 Rancangan Konstruksi Mesin (Machine Construction Designs) 3 SKS

Memberikan pengetahuan dan keterampilan tentang: perancangan dan analisa perancangan, konstruksi dengan beban sederhana da kombinasi, konstruksi dengan beban static dan dinamik, teori kegagalan, aplikasi perancangan dalam pemilihan/perecanaan komponen mesin seperti, perencanaan poros, pemilihan sabuk,pully, roda gigi,serta merumuskan dan menuangkan gagasan perancangan dengan analisa perancangan dari segi kekuatan bahan, fungsional, estetika, ergonomic, Teknik produksi,ekonomi, dan pembuatan gambar komponen.
(*Provide knowledge and skills about: design and analysis of design, construction with simple loads and combinations, static and dynamic load construction, failure theory, application design in the selection / planning of engine components such as shaft planning, belt selection, pully, gears, and formulating and pouring design ideas with design analysis in terms of material strength, functional, aesthetic, ergonomic, production techniques, economics, and making component drawings.*)

MES2.52.5010 Teknik Rekayasa (Design Engineering) 3 SKS

Memberikan pengetahuan yang berkaitan dengan teknik rekayasa, peran rekayasa dan desain dalam masyarakat, aspek dalam rekayasa, elemen kunci dalam analisis rekayasa, langkah penyelesaian masalah, konsep energi, konversi dan konservasi, penerapan prinsip sains dan matematika dalam rekayasa serta pengenalan beberapa disiplin rekayasa dan interaksinya dari hasil design rekayasa dan manufakturing.
(*Provide knowledge related to engineering techniques, the role of engineering and design in society, aspects of engineering, key elements in engineering analysis, problem solving steps, concepts of energy, conversion and conservation, application of scientific and mathematical principles in engineering and introduction to several engineering disciplines and their interactions from the results of engineering design and manufacturing.*)

MES2.52.5011 Penerapan Pengujian Mutu Las (Implementation of Weld Quality Testing) 3 SKS

Memberikan pengetahuan dan keterampilan tentang: Simbol las, persyaratan untuk menjadi welding inspector, posedur kerja weldinginspector, pertimbangan keselamatan kerja dalam pengujian dan pemeriksaan, pengawasan mutu, metalurgi las, preheating dan postweld, las dan cacat las, kualifikasi dari welding procedure specifications (WPS), kualifikasi dari juru las dan operator las, Pemeriksaan mutu pengelasan system komputerisasi, pengujian merusak, uji kekerasan, cara pemeriksaan tak merusak, kualifikasi pelaksana pemeriksaan tidak merusak, dan kode dan standar lainnya.
(*Provide knowledge and skills about: Welding symbols, requirements to become a welding inspector, weldinginspector work procedures, consideration of work safety in testing and inspection, quality control, weld metallurgy, preheating and postweld, welding and welding defects, welding procedure specifications (WPS) , qualifications of welders and welding operators, welding quality inspection of computerized systems, destructive testing, hardness testing, non-destructive inspection methods, inspection qualifications that do not damage, and other codes and standards.*)

MES2.52.5012 Teknologi Produksi Fabrikasi ((Fabrication Production Technology)) 3 SKS

Memberikan pengetahuan tentang Produksi Fabrikasi meliputi pekerjaan Teknik dan prosedur mulai dari pekerjaan perancangan, pembuatan gambar detail, proses pekerjaan, perakitan, uji coba dan finishing serta palaporan pekerjaan yang dilakukan dengan metode pengelasan serta aplikasinya dalam pembuatan produk dan memproduksi benda kerja terpakai dan tepat guna, berdasarkan teknik dan prosedur pengelasan, menerapkan perhitungan pemakaian bahan dalam setiap produk yang dibuat dan menerapkan kesehatan dan keselamatan kerja dalam sistem kerja.
(*Providing knowledge about Fabrication Production includes work Engineering and procedures starting from the design work, making detailed drawings, work processes, assembling, testing and finishing and reporting work carried out by the welding method and its application in manufacturing products and producing used and appropriate workpieces, based on welding techniques and procedures, applying the calculation of the use of materials in each product made and applying occupational health and safety in the work system.*)