

D4 - OCCUPATIONAL HEALTH AND SAFETY ENGINEERING

| SEMESTER I | | | | SEMESTER III | | | |
|------------|---------------------------------------------|-----|--------|--------------|----------------------------------------------|-----|--------|
| NO. | COURSE TITLE | HRS | CREDIT | NO. | COURSE TITLE | HRS | CREDIT |
| 1 | Religion | 2 | 2 | 1 | English III | 3 | 3 |
| 2 | English I | 3 | 3 | 2 | Occupational Health and Safety Law | 2 | 1 |
| 3 | Mathematics I | 4 | 2 | 3 | Safety on Steam Aircraft and Pressure Vessel | 4 | 2 |
| 4 | Physics | 4 | 2 | 4 | Material Testing (practical) | 4 | 2 |
| 5 | Chemistry | 4 | 2 | 5 | Prevention and Firefighting System | 4 | 2 |
| 6 | Mechanical Technology | 2 | 1 | 6 | Electrical Engineering | 4 | 2 |
| 7 | Introduction-Occupational Health and Safety | 4 | 2 | 8 | Instrumentation (tdk ada di silabus) | 2 | 1 |
| 8 | Computer Programming | 2 | 1 | 8 | Combustion Engine Technique | 4 | 2 |
| 9 | Engineering Drawing | 4 | 2 | 9 | Hazard Identification Techniques | 4 | 2 |
| 10 | Computer Programming (practical) | 4 | 2 | 10 | Industrial Waste Management | 4 | 2 |
| 11 | Indonesian Values and Ideology | 2 | 2 | 11 | Welding Technology | 2 | 1 |
| 12 | Indonesian Language | 2 | 2 | | | | |
| Total | | 37 | 23 | Total | | 37 | 20 |

| SEMESTER II | | | | SEMESTER IV | | | |
|-------------|-----------------------------------|-----|--------|-------------|------------------------------------------------|-----|--------|
| NO. | COURSE TITLE | HRS | CREDIT | NO. | COURSE TITLE | HRS | CREDIT |
| 1 | English II | 3 | 3 | 1 | English IV | 3 | 3 |
| 2 | Mathematics II | 4 | 2 | 2 | Ergonomics | 4 | 2 |
| 3 | Material Science | 2 | 1 | 3 | Pneumatic & Hydraulic (Practical) | 4 | 2 |
| 4 | Life Science | 2 | 1 | 4 | Working Environment Measurement (Practical) | 4 | 2 |
| 5 | Fluid mechanics | 4 | 2 | 5 | Electrical Engineering (Practical) | 4 | 2 |
| 6 | Engineering Mechanics | 2 | 1 | 6 | Prevention & Fire Fighting (Practical) | 4 | 2 |
| 7 | Industrial Hygiene | 4 | 2 | 7 | Steam Aircraft and Pressure Vessel (Practical) | 4 | 2 |
| 8 | Physics (Practical) | 4 | 2 | 8 | Entrepreneurship | 2 | 1 |
| 9 | Chemistry (Practical) | 4 | 2 | 9 | Combustion Engine (practical) | 4 | 2 |
| 10 | Mechanical Technology (practical) | 4 | 2 | 10 | Welding (Practical) | 4 | 2 |
| 11 | Thermodynamics | 4 | 2 | | | | |
| Total | | 37 | 20 | Total | | 37 | 20 |

| SEMESTER V | | | | SEMESTER VII | | | |
|------------|-----------------------------------------------|-----|--------|--------------|---------------------|-----|--------|
| NO. | COURSE TITLE | HRS | CREDIT | NO. | COURSE TITLE | HRS | CREDIT |
| 1 | Electrical Safety | 4 | 2 | 1 | On the Job Training | 40 | 15 |
| 2 | Ergonomics (Practical) | 4 | 2 | | | | |
| 3 | Risk Management and Reliability | 4 | 2 | | | | |
| 4 | First Aid | 6 | 3 | | | | |
| 5 | Control Techniques | 2 | 1 | | | | |
| 6 | Occupational Health and Safety on Chemistry | 4 | 2 | | | | |
| 7 | Fire Prevention Planning System | 4 | 2 | | | | |
| 9 | Occupational Health and Safety on Environment | 4 | 2 | | | | |
| 10 | Mechanical Safety | 4 | 2 | | | | |
| 11 | Process Control | 2 | 1 | | | | |
| | Total | 38 | 19 | | Total | 40 | 15 |

| SEMESTER VI | | | | SEMESTER VIII | | | |
|-------------|--------------------------------------------------|-----|--------|---------------|-----------------------|-----|--------|
| NO. | COURSE TITLE | HRS | CREDIT | NO. | COURSE TITLE | HRS | CREDIT |
| 1 | Research Methodology | 4 | 2 | 1 | Information System | 6 | 3 |
| 2 | Accident Analysis | 2 | 1 | 2 | Quality Control | 2 | 1 |
| 3 | Control Engineering (Practical) | 4 | 2 | 3 | Engineering Economics | 2 | 1 |
| 4 | Mining Safety | 4 | 2 | 4 | Thesis | 18 | 6 |
| 5 | Inspection on Occupational Health and Safety | 4 | 2 | | | | |
| 6 | Maritime Safety | 4 | 2 | | | | |
| 7 | Process Safety | 4 | 2 | | | | |
| 8 | Building Construction Safety | 4 | 2 | | | | |
| 9 | Occupational Health and Safety Management System | 4 | 2 | | | | |
| 10 | Industrial Psychology | 2 | 1 | | | | |
| 11 | Communication | 2 | 1 | | | | |
| | Total | 38 | 19 | | Total | 28 | 11 |

SYLLABUS

| | Course Title | Credits /Hrs | Objectives/Course Topics/References |
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| 1. | Religion Islamic Values | 2/2 | <p>Objectives: Students are able to understand, believe, and practice islamic values in everyday life.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • The role of religion in life • Islamic concept of God, the Book of Allah, the Prophet, Judgement Day, the universe • Islamic prospective about people • The basic principles of science and technology development. • Self Purification, personal and social education, social justice, fasting, Hajj, sources of Islamic Law. • Morals • Establishment of a family, the islamic society. • Research approach in the future. <p>References:</p> <ol style="list-style-type: none"> 1. Depag, <i>Alquran dan terjemahannya</i>, Bumi Restu, Jakarta 1971. 2. Lecturer of ITS, <i>Dasar-dasar Agama Islam</i>. 3. Harun Nasution, <i>Islam ditinjau dari berbagai aspeknya</i>, UI Press, Jakarta 1979. 4. Endang Syaifudin A, <i>Wawasan Islam</i>, Pustaka Jakarta 1985 5. Zakiyah Darajat, A. Sadali, <i>Dasar-dasar Agama Islam, Proyek Pembinaan Agama pada Perguruan Tinggi Umum</i>, Jakarta, 1985. 6. Maurici Bucaille, <i>Asal-uyul Manusia menurut Al Qur'an Bibel dan Sains</i>, Pustaka Jakarta. |
| | Protestant | 2/2 | <p>Objectives: Students are able to understand and become a new creation of Jesus Christ. It is expected that the students can devote the whole of his life and all his scientific work for the benefit of others in all aspects of life and the field of which he/she serves for the honor and glory of God.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Awareness of religion in human life. • The meaning of faith (recognition, revelation, testimony). • Religion Phenomonology (similarities and differences of understanding). • Religion and <i>Pancasila</i> • Man as the image of God (man as bearer of God's mandate). • Human relations and science. • The meaning of God's law and human's responsibilities for the community and the nation <p>References:</p> <ol style="list-style-type: none"> 1. Lembaga Alkitab Indonesia, Alkitab. 2. Dr. Franz Dahler, <i>masalah Agama</i>. 3. Dr. Honig, <i>Ilmu Agama</i>. 4. Dr. Bleeker, <i>Pertemuan Agama Dunia</i>. 5. Dr. Schuman Olaf, <i>Dialog Antar Umat Beragama</i>. 6. Dr. Walter Lempp, <i>Mahasiswa Bertanggung jawab</i>. |

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| Catholic | 2/2 | <p>7. Dr. Walter Lempp, <i>Membangun Manusia Pembangun</i>.</p> <p>8. Dr. H. Hadiwijono, Iman Kristen. Malcon Brwonly, M.Th, <i>Pengambilan Keputusan Etis</i>.</p> <p>9. Dr. DC Mulder, <i>Iman Kristen dan Ilmu Pengetahuan</i>.</p> <p>10. Sularso Sopater, <i>Iman Kristen dan Ilmu Pengetahuan</i>.</p> <p>11. Dr.J.Verkuyl, <i>Etika Kristen</i>.</p> <p>Objectives: Students are able to improve the understanding of the concept of faith in the Church properly. Adopt church values and society in developing attitudes and mentality of a Catholics that can prove himself to the interests of the people of Indonesia as an expression of faith.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Faith of church • Church as sacraments of salvation • The decision of the church • Human responsibility as a member of the church • Church services • Leadership in church. <p>References:</p> <ol style="list-style-type: none"> 1. R. Hadiwiyono Sy, <i>Membina Jemaat Beriman</i>, Jakarta : Dokpen MAWI. 2. Y. Riberu, <i>Ilham bagi para pengilham</i>, Jakarta, Penerbit Luseat. 3. Thom Yakobs, <i>Dinamika Gereja</i>, Jogjakarta : Yayasan Canisius. 4. A.P. Budiyo, <i>Mendalami Kitab Suci Dalam Kelompok dengan 30 orang</i>, Jogjakarta : Yayasan Canisius. 5. A.M. Mangunwijaya, <i>Mengatasi Hambatan-hambatan Kepribadian</i>, Jogjakarta : Yayasan Canisius. |
| Hinduism | 2/2 | <p>Objectives: Students are able to understand and appreciate the religious values, reinforce the belief, faith and worship a Hindu to Sang Hyang Widhi Wasa / God, so that they can control their thinking, speaking and acting in the service to nation and society.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • History of Hinduism • Sources of Hindu teachings • The scope, Mawa Darsana • Tantrayaman, Panca Siadha Tattwa • Chess Marga Yoga Social institutions • Kala Dharma, Dharmadaa, • Budhisatewa and the concept of religious harmony <p>References:</p> <ol style="list-style-type: none"> 1. Sociology of Hindu Dharma. 2. Introduction to Hinduism I, II. 3. Hindu Theology. 4. P4 and Hinduism. 5. Hindu leadership. |

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| | Buddhism | 2/2 | <p>Objectives: Students are able to understand and practice the precepts belief in God Almighty, Dharma and services to strengthen the faith (sodha) in maintaining the the harmony of life.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • The nature of God • The conception of religious harmony • Budhisatwa and Buddhism. <p>References:</p> <ol style="list-style-type: none"> 1. Oka Diputhera, <i>Citra Agama Budha dalam filsafat Pancasila</i>. 2. Departemen Agama RI, <i>Pedoman Pelaksanaan P-4 bagi Agama Budha</i>. 3. Proyek Pengadaan Kitab Suci Budha, <i>Dhammapada</i>. 4. Bhikku kheniyo, <i>Pancasila dan Pancadharm</i>. |
| 2. | English I | 2/4 | <p>Objectives: Students are able to understand and apply the rules of English and be able to understand the discourse in English.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Simple reading and writing • Read the operating instructions of safety equipment and formal documents • Write article specifically in the field of safety • Create a summary <p>References:</p> <ol style="list-style-type: none"> 1. Alexander, LG. <i>Practice and Progress</i>, Yogyakarta : Kanisius 2. Alexander LG. , <i>Developing Skills</i>. Yogyakarta: Kanisius 3. Bloemendal, M.G. 4. Hutchinson, Tom and Walters, Alan. <i>Interface : English for Technical Communication</i>. 5. Blakey , TN. <i>English for Maritime Studies</i>. Oxford : Pergamon Press. 6. Subandi, <i>English Conversation on Shipping Business</i>. Jakarta : Arcan 7. Donovan, Peter. <i>Basic English for Science</i>. Oxford Univ. Press |
| 3. | Mathematics I | 2/4 | <p>Objectives: Students are able to apply basic math for other courses.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Determinants • Matrix • Vector Algebra • Complex Numbers • Function of Differentiation • Application of Differentiation • Uncertain Integration <p>References:</p> <ol style="list-style-type: none"> 1. Diktat Kuliah Matematika I, II, FMIPA ITS 2. Bird, J. O. and A.J.C May Technicians, <i>Longman Scientific & Technical</i> , 1978 3. Stroud, K. A. , <i>Matematika untuk Teknik</i>, Penerbit Erlangga, 1995 4. Baisuni, H. M. H., <i>Kalkulus</i>, UI Press, 1986 5. Irwin, J. R., <i>Essentials of Applied Mathematics</i>, Edward Arnold Ltd., 1986 |

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| 4. | Physics | 2/4 | <p>Objectives: Students are able to understand the concepts of physics, the basic laws of physics, then apply them in solving engineering problems.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • System of Units. • Vector, Electrostatics. • Electric Current. • Field Magnetism, Inductance. • The spectrum of electromagnetic waves. • Core Physics. • Kinematics and particles dynamics • Work and Energy, Impulse and Momentum. • Rotation Dynamics. Equilibrium. • Fluid Statics. Fluid Dynamics. • Heat. Kinetic Theory of Gases. • Sound, Light. • Waves, Optics • Atomic Structure • Nuclear Physics <p>References:</p> <ol style="list-style-type: none"> 1. Halliday-Resnick, <i>Fundamental of Physics</i>. 2. Alonso-Finn, <i>Fundamental University Physics</i>. 3. Lecturer in Physics of FMIPA-ITS, <i>Diktat Fisika I & II</i>. |
| 5. | Chemistry | 2/4 | <p>Objectives: Students are able to understand the basic concepts of chemistry and solve the chemical problems.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Introduction to Chemistry. • Theory of atoms, periodical relationship. • Basic laws of chemistry. • Chemical Bonding, Equilibrium. • Solution. • Oxidation-Reduction Reactions. • Electrochemistry. • Radioactivity. <p>References:</p> <ol style="list-style-type: none"> 1. Cald Well, <i>College Chemistry</i>. 2. Michell J. Sienko, <i>Chemistry</i>. 3. PEDC Bandung, <i>Course Notes in Chemistry</i>. |
| 6. | Mechanical Technology | 1/2 | <p>Objectives: The students are expected to be able to:</p> <ol style="list-style-type: none"> a. use and operate workshop powered equipment and fabrication equipment by understanding the norms of safety b. know the procedures of working bench c. know the procedures and safe operation in workshop/laboratories. d. operate scrap machinery, milling machine, lathes <p>Course Topics:</p> <ul style="list-style-type: none"> • Measuring Instruments • Variance of working equipment. • Image Marking Out • Bench Tool |

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| | | | <ul style="list-style-type: none"> • Types and functions of lathe. • Sharpening and setting a chisel with high accuracy • Adjusting direction and speed of the engine. • Procedure and practice of evaluation of lathe's work result. • Functions and manual instruction of scrap machinery and evaluation <p>References:</p> <ol style="list-style-type: none"> 1. Schonmetz dan Frischhers, <i>Pengerjaan Logam Dengan Mesin Perkakas</i>. 2. Daryanto, <i>Pengetahuan Tentang Metalurgi</i>, Tarsito Bandung. 3. Choundhury Hajra, <i>Elemet Of Workshop Technology</i>. 4. Daryanto, <i>Petunjuk Keselamatan Kerja Dalam Perbengkelan Mesin</i>. |
| 7. | Introduction to Occupational Safety & Health | 2/4 | <p>Objectives:</p> <p>The students are expected to be able to understand the basic understanding about occupational safety and health (OSH). Also, they can explain the prevention and management techniques in general OSH; and analyse accidents in the workplace; can apply OSH in the work place.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Explain the term of OSH (hazard, danger, risk, incident, accident, safety, unsafe actions, unsafe condition, safety and health works) and OSH goals • The basic law of OSH • The basic principles of Occupational Health and Safety • The history of OSH • The accident, the frequency, number and level of hazard • The causes, effects and prevention of occupational accidents • Analysis and reporting accident • Distribution of accident according to place, time, and the affected organs • Accident control measures • Basic principles of occupational health and explain the functions of occupational health inspection • Functions and role of the doctor in workforce • Regulatory of safety and health <p>References:</p> <ol style="list-style-type: none"> 1. K. Suma'mur P., MSc., <i>Keselamatan Kerja dan Pencegahan Kecelakaan</i>, Gunung Agung, Jakarta. 2. Blake R.P. , <i>Industrial Safety</i>, Englewood Cliffs N.J. , Prentice Hall Inc. 1963. 3. De Reamer R, <i>Modern Safety Practicees</i>, Newyork, John Willey & Sons Inc, 1958 4. <i>Modul umum pembinaan operasional P2K3</i> Departemen Tenaga Kerja RI, 1998/1999. 5. UU No. 1 Th 1970 tentang K3 6. Permen No.02 th.1980 tentang pemeriksaan kesehatan tenaga kerja dari penyelenggaraan keselamatan kerja. 7. Permen No. 03 th.1982 tentang Pelayanan kesehatan |
| 8. | Programing | 1/2 | <p>Objectives:</p> <p>Students are able to use computer as data processing equipment and be able to make a simple program using programming language.</p> <p>Course topics:</p> <ul style="list-style-type: none"> • Basic Computer. |

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| | | | <ul style="list-style-type: none"> • Information and Data and Software. • The basic concepts of computer networks • Security on the intranet • Database • Entity Relationship Diagram • Transforming ER Diagrams to Physical Database • SQL commands • logic and arithmetic operators • Flowcharts and algorithms. • Programming with Turbo Pascal • Statement in Turbo Pascal • Procedures and functions in Turbo Pascal <p>References:</p> <ol style="list-style-type: none"> 1. O'Leary, Timothy J O'Leary, Linda I. , <i>O'Leary Series: MS Office 2000 Enhanced Edition</i>, Irwin/McGraw-Hill, 2000 2. Stephen O'Brien, <i>Turbo Pascal 6, The Complete Reference</i>, Borland-Osborne, McGraw-Hill, 1991 3. Evangelos Petrousos, <i>Menguasai Pemrograman Database dengan Visual Basic 6</i>, Elex Media Komputindo, 2002 4. Imam Heryanto, Budi raharjo, <i>Memahami Konsep SQL dan PL/SQL di Oracle</i>, Informatika Bandung, 2002 5. MADCOMS, <i>Aplikasi Database Visual Basic 6 dengan Crystal Report</i>, Penerbit ANDI Yogyakarta, 2003 |
| 9. | Engineering Drawing | 2/4 | <p>Objectives: Students are able to create and read engineering drawings draft according to ISO as well as to create an image as usefull and precise information provider</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Picture function • Introduction to drawing tools, Standardization, Geometric Construction, Orthografic Projection • Visualization, cutting principles • Appointment • Tolerance, Aperture • Isometric Figure <p>References:</p> <ol style="list-style-type: none"> 1. PEDC, <i>Gambar Teknik</i>, 1984. 2. Verren J. huzadden, PE, <i>Menggambar Teknik</i>, alih bahasa oleh Hendarsi , H. Erlangga Jakarta, Edisi ke 8, 1986. 3. Sato G.T. dan Hartanto N.S, <i>Menggambar Mesin menurut Standart ISO</i>, PT. Pradaya Paramita Jakarta, 1983. |
| 10. | Computer Programming | | <p>Objectives: Students are able to understand hardware and how it works. The students are also expected to be able to operate, apply, as well as design a software.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Hardware and Networking • Ms. Word • Ms. Excel • Ms. PowerPoint • Ms. Visio • Ms. Access |

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| | | | <ul style="list-style-type: none"> • Turbo Pascal • Visual Basic <p>References:</p> <ol style="list-style-type: none"> 1. O'Leary, Timothy J O'Leary, Linda I. , <i>O'Leary Series: MS Office 2000 Enhanced Edition</i>, Irwin/McGraw-Hill, 2000 2. Stephen O Brien, <i>Turbo Pascal 6, The Complete Reference</i>, Borland-Osborne, McGraw-Hill, 1991 3. Evangelos Petrousos, <i>Menguasai Pemrograman Database dengan Visual Basic 6</i>, Elex Media Komputindo, 2002 4. Imam Heryanto, Budi raharjo, <i>Memahami Konsep SQL dan PL/SQL di Oracle</i>, Informatika Bandung, 2002 5. MADCOMS, <i>Aplikasi Database Visual Basic 6 dengan Crystal Report</i>, Penerbit ANDI Yogyakarta, 2003 |
| 11. | Indonesian Values and Ideology | 2/2 | <p>Objectives: Students are able to have a national comprehensive knowledge and have integral approach in addressing the problems of social life, economic, politics, culture, and also defense.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • The nature of state study • The theory of the state • The purpose and shape of the state • History of the Indonesian independence • History of Republic of Indonesia constitution • Archipelago • National Security • <i>GBHN and Repelita</i> <p>References:</p> <ol style="list-style-type: none"> 1. Mr. M. Hutahuruk, dkk, <i>Civics P dan K Jakarta</i>, 1960 2. Prof. Mr. M. Nasroen, <i>Asal Ilmu Negara</i>, Aksara, Jakarta, 1986 3. Suhino, SH, <i>Sejarah Ketatanegaraan Indonesia</i>, Leberty, Jogjakarta, 1984 4. Hasan Zainuri, SH, <i>Pengantar Hukum Tata Negara</i>, Alumni, Bandung 1992 |
| 12. | Introduction to Industrial Technology | 1/2 | <p>Objectives: Students are able to know and understand the basic principles of technology and then implement by drafting technological development that benefit for the community and education.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • The history and basic concepts of science & technology • Definition of culture acceleration • Introduction to engineering, technology, industry and the process • Ethics and community logic • Human and trauma • Technology and culture • Decision-making • Algorithms & Criteria • Dynamic Programming • Optimization • System and Modelling <p>References:</p> <ol style="list-style-type: none"> 1. _____, <i>Engineering concept curriculum project</i>, Polytechnic Institut of Brooklyn The manmade world, Mc Graw – Hill Book |

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| | | | <p>Company, New York, 1971</p> <ol style="list-style-type: none"> ITS, Surabaya. <i>Pengantar Ilmu Pengetahuan dan Teknologi (1999)</i>. ITB, Bandung. <i>Konsep Teknologi</i>. |
| 13. | English II | 2/4 | <p>Objectives: Students are able to communicate in English both oral and written.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> day-to-day conversation (greetings, introduction, daily activities, requesting, agreeing-disagreeing, etc..) Describe the characteristics and position of objects Comparing the characteristics and position of objects Filling in a simple form <p>References:</p> <ol style="list-style-type: none"> Long, MN and Richards, JC. Breakthrough. Alexander, LG. Practice and Progress. Alexander LG. Developing Skills. Richards,JC and Bycina, David. Person to person: Communicate Speaking and listening skills. Oxford : Oxford University Press. Curry Dean. Everyday Conversation 2. Jakarta : PT Gramedia Pustaka Utama. Blakey,TN. English for Maritime Studies. |
| 14. | Mathematics II | 2/4 | <p>Objectives: Students are able to apply basic math to other courses.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> Integral Application Specific (area, volume, arc length, surface area of skin, in polar coordinates and the coordinates) Central Mass Moment of inertia Fluid Pressure Power Numerical Integration Front and line Ordinary Differential Equations <p>References:</p> <ol style="list-style-type: none"> Diktat Kuliah Matematika I, II, FMIPA ITS Bird, J. O. and A.J.C May, <i>Technicians</i>, Longman Scientific & Technical , 1978 Stroud, K. A. , <i>Matematika untuk Teknik</i>, Penerbit Erlangga, 1995 Baisuni, H. M. H., <i>Kalkulus</i>, UI Press, 1986 Irwin, J. R., <i>Essentials of Applied Mathematics</i>, Edward Arnold Ltd., 1986 |
| 15. | Materials Science | 1/2 | <p>Objectives: Students are able to understand, explain and select the type and properties of engineering materials for general use in the field of engineering.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> Classification of engineering materials. Ferrous Metals. Non-Ferrous Metals. Non Metal Material. Composite Materials. Insulation Material & Conductor. |

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| | | | <ul style="list-style-type: none"> • Semi-Conductor Material & Super Conductor. • Magnet Material • Organic Material • Synthetic Material • Basic industrial chemicals • Structure and charging of the material. • Vibration, alkalinity and corrosion. <p>References:</p> <ol style="list-style-type: none"> 1. Higgins RA, <i>Material for Engineer Technicians</i>. 2. Tareev B.M, <i>Material for Engineering</i>, Higher School Publish Moscow 3. JohnVernon B, <i>Introduction to Engineering Materials</i>, London Inc. 1979 4. H. Hubscher, J. Klaue, W. Pfluger. S. Appelt, <i>Electrical Engineering Basic Technology</i>. |
| 16 | Life Science | 1/2 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to explain and have a basic knowledge (in outline) of the body structure (anatomy) and the workings of the human body system (physiology). 2. Students are able to analyze the case in the workplace (poisoning, heat exhaustion, fire, etc.) based on the basic theory of the anatomy and physiology of the human body. 3. Students have a basic knowledge of the prerequisite courses: first aid. <p>Course Topics:</p> <ul style="list-style-type: none"> • The definition of life science • Locomotorium system and case analysis. • Cardiovascular system and case analysis. • Digestorium system and case analysis. • Endocrine system and case analysis. • Neuron system and case analysis. • Senses and case analysis. • Urogenital system and case analysis. • Reproductive system and case analysis. • Respiratory system and case analysis. <p>References:</p> <ol style="list-style-type: none"> 1. Higgins RA, <i>Material for Engineer Technicians</i>. 2. Tareev B.M, <i>Material for Engineering</i>, Higher School Publish Moscow 3. JohnVernon B, <i>Introduction to Engineering Materials</i>, London Inc. 1979 4. H. Hubscher, J. Klaue, W. Pfluger. S. Appelt, <i>Electrical Engineering Basic Technology</i>. |
| 17. | Pneumatic and Hydraulic | 1/2 | <p>Objectives:</p> <p>Students are able to have a basic knowledge of mechanical control using air or oil mover media to control mechanisms for pneumatic and hydraulic machines.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Pneumatic symbols • Pneumatic elements and functions • Pneumatic basic circuits • Pneumatic and hydraulic |

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| | | | <ul style="list-style-type: none"> • The symbol of pneumatic and hydraulic, • Pneumatic and hydraulic elements and functions References: <ol style="list-style-type: none"> 1. Herman WS, <i>Sistem Pengendalian Dan Umpan Balik</i>, Erlangga 1996. 2. Pakpahan s, <i>Kontrol Otomatik Erlangga Jakarta</i>. 3. Ernset C. Fitch, <i>Fluid Power and Control system</i>, Mc Graw – Hill Book Company, New York, 1966 4. Festo Didatic, <i>Fundamentals of Pneumatic Control Engineering</i>, Essligen 1987 |
| 18. | Engineering Mechanics | 1/2 | Objectives: Students can understand and calculate the basic stress, geometrical properties, mechanical properties, stress in axial loading, internal force. static strength and indeterminate static. Course Topics: <ul style="list-style-type: none"> • The concept of voltage, geometric properties, Mechanical Properties • Stress strain on axial loading • Internal force, torque • Imposition of Combination References: Beer, Ferdinand Pierre dan E. Kussel Jhonston Jr., <i>Mechanics of Materials, 1st printing</i> , Mc Graw Hill, 1981. |
| 19. | Industrial Hygiene | 2/4 | Objectives: Students are able to know and understand potential hazards in the workplace, and implement the control of potential hazards Course Topics: <ul style="list-style-type: none"> • Definition of Industrial Hygiene • Identification of potential hazards (Recognizing) <ol style="list-style-type: none"> a. Potential danger of physical factors (noise, radiation, air pressure, light, vibration, humidity) b. Potential hazards of chemical factors (Oxidazing Material, Explosive Material, Corrosive Material, Highly Flammable Material, Toxic Materials, Radioactive Materials, Materials Irritant, Harmful Materials.) c. The potential dangers of ergonomic factors (work attitudes, ways of working, etc.) d. The potential dangers of biological factors (viruses, bacteria, fungi, animals) e. The potential danger of psychological factors (job stress, work absences, jobs changing) • Assessment of hazard factors (Evaluating) <ol style="list-style-type: none"> a. Introduction to gauge the potential hazards b. Basic measurement theory c. Sampling of measurement • Control of the potential hazard (controlling) <ol style="list-style-type: none"> a. Engineering control, i.e. is substitution, elimination, isolation and enclosing, housekeeping, industrial ventilation) b. Administrative control, i.e. labeling, education and training, health, sanitation c. Personal Protective Equipment (PPE), i.e. headwear, protective eyewear, protective nose and mouth, ear protection, whole body protection, safety belt / body harness, hand protectors, |

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| | | <p>foot protectors.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Suma'mur P.K, Dr., M.sc, <i>Higiene Perusahaan dan Kesehatan Kerja</i>, Gunung Agung, Jakarta, 1967. 2. Kavianian, Hamid R, <i>Occupational and Environmental Safety Engineering and Management</i>, Van Nostrand Reinhold, New York, 1990. 3. Budiono, Sugeng A.M dkk, <i>Bunga Rampai Hiperkes dan KK</i>, Edisi Kedus, Badan Penerbit Universitas Diponegoro, Semarang, 2003. 4. Asfahl, C. Ray, <i>Industrial Safety and Health Management</i>, Fourth Edition, Prentice Hall, Upper Saddle River, New Jersey, 1999. 5. Sahab, Syukri, Dr.MS, <i>Teknik Manajemen dan Kesehatan Kerja</i>, PT. Bina Sumber Daya Manusia, Jakarta, 1997. 6. Hammer, Willie, <i>Occupational Safety Management Engineering</i>, Fourth Edition, Prentice Hall, 1989. 7. McCormick and friend, <i>Human Factors in Engineering and Design</i>, Fifth Edition, Tata McGraw-Hill Publishing Company, New Delhi, 1982. 8. Veasey, D.Alan and friends, <i>Confined Space and Emergency Response</i>, McGraw-Hill, United State, 2002. |
| 18. | Physics (Practical) | <p>Objectives: Students are able to understand and explain physical phenomena in nature such as the dynamics of motion, heat, and electric induction.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Motion on an inclined plane • Centrifugal force • Pulley systems • Circular motion on the wheel • Moment of inertia • Acceleration of earth gravity • Acceleration of earth gravity with a physical pendulum • Calorimetry • Archimedes Law • Transformer <p>References:</p> <ol style="list-style-type: none"> 1. Halliday-Resnick, <i>Fundamental of Physics</i>. 2. Alonso-Finn, <i>Fundamental University Physics</i>. 3. Lecturer in Dept. of Physisc FMIPA-ITS, <i>Dikat Fisika I & II</i>. |
| 19. | Chemistry (Practical) | <p>Objectives: Students are able to understand the basic concepts of chemistry and be able to solve the problems associated with chemical properly.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Chemical Bonding. • Equilibrium. • Solution. • Oxidation-Reduction Reactions. • Electrochemistry. • Corrosion <p>References:</p> <ol style="list-style-type: none"> 1. Cald Well, College <i>Chemistry</i>. 2. Michell J. Sienko, <i>Chemistry</i>. 3. PEDC Bandung, Course Note Ilmu Kimia. |

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| 20. | Mechanical Technology (Practical) | 2/4 | <p>Objectives: The students are expected to be able to:</p> <ul style="list-style-type: none"> e. use and operate workshop powered equipment and fabrication equipment by understanding the norms of safety f. know the procedures of working bench g. know the procedures and safe operation in workshop/laboratories. h. operate scrap machinery, milling machine, lathes <p>Course Topics:</p> <ul style="list-style-type: none"> • Measuring Instruments • Variance of working equipment. • Image Marking Out • Bench Tool • Types and functions of lathe. • Sharpening and setting a chisel with high accuracy • Adjusting direction and speed of the engine. • Procedure and practice of evaluation of lathe's work result. • Functions and manual instruction of scrap machinery and evaluation <p>References:</p> <ol style="list-style-type: none"> 5. Schonmetz dan Frischhers, <i>Pengerjaan Logam Dengan Mesin Perkakas</i>. 6. Daryanto, <i>Pengetahuan Tentang Metalurgi</i>, Tarsito Bandung. 7. Choundhury Hajra, <i>Elemet Of Workshop Technology</i>. 8. Daryanto, <i>Petunjuk Keselamatan Kerja Dalam Perbengkelan Mesin</i>. |
| 21. | Thermodynamics | 2/2 | <p>Objectives: Students are able to solve engineering problems with the concept of thermodynamics.</p> <p>Course Topics:</p> <ol style="list-style-type: none"> 1. Basic - Engineering Thermodynamics 2. Law of Thermodynamics Number 0, I, II and III 3. Properties of pure fluids (gas and ideal solution) 4. Thermodynamic flow process 5. Cycles of Ideal Gas Power 6. Cycle of Steam Power 7. Cycle of Cooling 8. Heat Transfer <p>References:</p> <ol style="list-style-type: none"> 1. Joel. R, 1984, <i>Basic Engineering Thermodynamic in SI Unit</i> 2. J.M. Smith, 1996, <i>Introduction to Chemical Engineering Thermodynamics</i> |
| 22. | English III | 1/2 | <p>Objectives: Students are able to understand and explain the discourse in specific contexts, write simple article and translate correctly.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Reading journals • Describe the process and make a report • Writing scientific essays, Translating <p>References:</p> <ol style="list-style-type: none"> 1. Rooks, George M. <i>Share Your Paragraph : An Interactive Process Approach to Writing</i>, Englewood Cliffs : Prentice Hall Regent 2. Johan, A. Ghani, <i>Reading and translation</i>, Yogyakarta : Pustaka Pelajar |

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| | | | 3. Hutchinson, Tom and Walters, Alan, <i>Interface : English for technical communication</i> |
| 23. | Occupational Health and Safety Law | 1/2 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students know and be able to implement the law or regulations in work place 2. Students know the legal implementation of OHS at Work. <p>Course Topics:</p> <ul style="list-style-type: none"> • Health and Safety Expert • Asbestos • Company's Doctor and paramedic • Social Security • General OHS • Accidents • Employment • Chemistry • Occupational Health • Fires, welding, lift • Electricity and Lightning • Building Construction • Electric Steam and Pressure Vessel • <i>PJK3</i> • Aircraft Power and Production • other relevant regulations (latest regulations on OHS) <p>References:</p> <ol style="list-style-type: none"> 1. PNKK, Training Material of OHS, OHS Regulation, Ministry of Manpower and Transmigration 2. Directorate General of Industrial Relations and Labour Inspection, Compilation of OHS Regulation, Ministry of Manpower and Transmigration |
| 24. | Safety on Steam Aircraft and Pressure Vessel | 2/4 | <p>Objectives:</p> <p>Students are able to identify provisions related to planning; manufacture; assembly; application, in order to save, protect and report procedures for handling Steam Aircraft and Pressure Vessel.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Definition & Glossary of Boiler and Pressure Vessel • Types of Boiler • The cause of Blasting Boiler • Preparation of Boiler Inspection and Testing • Dangerous sources of Pressure Vessel • Practical Technical Knowledge of Pressure Vessel • Technical administration of safety on Steam aircraft and Pressure Vessel • Surveillance on Steam Aircraft & Pressure Vessel Repair <p>References:</p> <ol style="list-style-type: none"> 1. T. D. Morton, <i>Motor Engineering Knowledge for Marine Engineers</i>, Edisi II Sunderland and London, Thomas Reed Publication Ltd, 1978. 2. L Jacson and T. D. Morton, <i>Motor Engineering Knowledge for Marine Engineers</i>, Edisi IV, Sunderland and London, Thomas Reed Publication Ltd, 1986. 3. Djokosetyardjo, MJ, PT Pradnya Paramita, Jakarta, 1999. |

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| 25. | Material Testing (Practical) | | <p>Objectives: Students are able to understand the basis of testing mechanical properties of a material (pull, stretch, contraction, modulus of elasticity, quality welds with weld-destructive and non-destructive way.)</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Destructive Test Practice: tensile testing, impact, hardness, macro etching, fracture, • Non Destructive Test Practice: visual testing, magnetic, ultrasonic, dye penetrant and radiography <p>References:</p> <ol style="list-style-type: none"> 1. Measurement of Mechanical properties 2. Testing and Inspection of Engineering Materials 3. <i>Non Destructive Testing</i>, Barry, Hull, Vermanjau 4. RBI (Risk Based Inspection) |
| 26. | Occupational Health and Safety Management System (SMK3) | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to understand and have knowledge of OHS management functions 2. Students are able to explain the importance of OHS management in loss control efforts in organization/company 3. Students are able to explain the role of each OHS management functions in relation to the application and implementation of OHS efficiently and effectively <p>Course Topics:</p> <ul style="list-style-type: none"> • General Management • Principles of OHS and management system • Definition of SMK3 • Design Steps of SMK3 • Documentation of SMK3 • Benefits of SMK3 Application • SMK3 Audit <p>References:</p> <ol style="list-style-type: none"> 1. Ministry of Manpower and Transmigration "Standard Application Management System of Occupational Health" 2. PNKK, Regulation Compilation of Ministry of Manpower and Transmigration 3. Sprigel, Lanaburgh William R, <i>Industrial Management</i>, New York: John Wiley and sons |
| 27. | Electrical Engineering | 2/4 | <p>Objectives: Students are able to understand the concept of law and the electrical system and the principle of work includes the installation of electricity, electrical machinery and electrical measuring instruments.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • The electric power system • Electrical Resistance • Analysis of electric circuits • Generation of electricity • Transmission system and distribution of electricity • Electrical and lighting Installation • Protection Equipment • Electrical Machines • Electric Measuring Instrumentation <p>References:</p> |

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| | | | <ol style="list-style-type: none"> 1. A.E. Fitzgerald, David E.H., Basic Electrical Engineering, 1975. 2. A.R. Margunadi, Dasar-dasar Teori Rangkaian. 3. GTZ Gmbh, Electrical Engineering Basic Technology. 4. William D. Cooper, Instrumentasi Elektronik and Teknik Pengukuran 5. Kingsly C.Ftzgerald A.E, Kusto A, Electrical Machinery, Mr-Graw Hill 1971 6. Wolfgang Muller,Electrical Power Engineering Proficiency Course 7. Ewar J.D Electrical Machinery, Macmillan Education Ltd 1986 |
| 28. | Pneumatic and Hydrolic (Practical) | 2/4 | <p>Objectives: Students are able to understand and operate basic knowledge of mechanical control using air or oil mover media to control mechanisms on pneumatic and hydraulic machines.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Symbols of pneumatic, • Pneumatic elements and functions, • Practical of Basic pneumatic circuits, • The pneumatic and hydraulic, • Safety control on pneumatic and hydraulic, <p>References:</p> <ol style="list-style-type: none"> 1. Herman WS, <i>Sistem Pengendalian Dan Umpan Balik</i>, Erlangga 1996. 2. Pakpahan s, <i>Kontrol Otomatik</i> Erlangga Jakarta. 3. Ernset C. Fitch, <i>Fluid Power and Control system</i>, Mc Graw – Hill Book Company, New York, 1966 4. Festo Didatic, <i>Fundamentals of Pneumatic Control Engineering</i>, Essligen 1987 |
| 29. | Combustion Engine Technique | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students can operate and maintain the primary diesel engine. 2. Students can operate and maintain boiler 3. Students have knowledge and understand the steam turbine. <p>Course Topics:</p> <ul style="list-style-type: none"> • Describe the main parts of the main diesel engine (stationary, moving, moving a moment) namely, low speed diesel motor, medium speed and high speed. • Explain the timing diagram of 4 stroke and 2 stroke diesel and the possible causes of the changes and return to the appropriate conditions. • Explain PV diagram of 4 stroke and 2 stroke diesel and analysis of occurred changes. • Explain the firing order of 4-stroke and 2-stroke diesel engine and firing interval. • Explain constante fuil oil and admiralty constante. • Describe the heat balance associated with fuel consumption efficiency, assess and calculate the amount of weight in relation to the the influences of air temperature and density of air with the presence of inter cooler. • Diagram the opening of the suction valve and exhaust valve. • Describe the cooling system and the main diesel engine lubrication systems. • Understand the function of a water pipe boiler • Distinguish the types of water pipe boiler. |

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| | | | <ul style="list-style-type: none"> • Understand equipment and tools in steam kettle drum. • Understand and describe the construction of a water pipe boiler. • Understand boiler water treatment and calculate the yield of the boiler • Explain the functions on board steam turbine • Explain and portray action and reaction turbines • Explain the degree of reaction. • Explain and portray the piston blind. • Describe the reaction ran turbine combined action, explaining turbine power settings. • Explain and describes the total yield of the installation.. • Explain and portray fall heat and enthalpy of water. • Describe the velocity triangles and applied. • Describe the specific fuel consumption at the steam plant. • Explain the use of packing steam turbine safety devices, reduction gear arrangement, and a steam turbine lubrication system. <p>References:</p> <ol style="list-style-type: none"> 1. T. D. Morton, <i>Motor Engineering Knowledge for Marine Engineers, Edition II</i> Sunderland and London, Thomas Reed Publication Ltd, 1978. 2. L Jacson and T. D. Morton, <i>Motor Engineering Knowledge for Marine Engineers, Edition IV</i>, Sunderland and London, Thomas Reed Publication Ltd, 1986. 3. Permesinan oleh team BPLP Semarang 4. Setyardjo MJ Djoko, <i>Ketel Uap</i>, PT Pradnya Paramita Jakarta, 1999 |
| 30. | Hazard Identification Techniques | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to use the methods of hazard analysis correctly 2. Students are able to identify the use of hazard analytical methods 3. Students are able to analyze the results of hazard identification and apply such a method in real conditions <p>Course Topics:</p> <ul style="list-style-type: none"> • A basic understanding of hazards in the workplace • Understanding and deepening understanding of the analysis and evaluation of potential hazards • The process of hazard evaluation studies, identification of hazard evaluation methods and results • The use of hazard identification methods, namely: <i>safety review, checklist analysis, relative ranking, Preliminary hazards analysis, what-if analysis, what-if/checklist analysis, HAZOPS, FTA, Event tree analysis, cause-consequences analysis, human reliability analysis</i> • The principles of hazard identification techniques model selection <p>References:</p> <ol style="list-style-type: none"> 1. <i>Guidelines for hazard evaluation procedures</i>, CCPS, 1992 2. <i>Process safety analysis: an introduction</i>, Bob Skelton, 1997 3. <i>Occupational safety management and engineering</i>, Willie hammer, 2001 4. <i>An introduction to Reliability and maintainability</i>, Charles E. Ebeling, 1997 |
| 31. | Mechanical Safety | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to explain and understand the basic knowledge of mechanics safety norms 2. Students are able to know the dangerous sources in the field of Mechanical |

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| | | | <p>3. Students are able to control dangerous sources in the field of Mechanical</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Lift & Transport Aircraft • Power & Production Aircraft • Fabrication in Mechanical Field • Procedures for handling / using tools safely • Equipment Using/handling in safety system. • Maintenance and operation of equipment • Potential hazards on material handling • The equipment for material handling process <p>References:</p> <ol style="list-style-type: none"> 1. Ministry of Manpower and Transmigration <i>K3 Field Training Material Mechanics</i> 2. Hand Out of Course "Safe Handling of Materials" University of Wisconsin 3. L Jacson and T. D. Morton, <i>Motor engineering Knowledge for Marine Engineers, Volume IV</i>, Sunderland and London, Thomas Reed Publications Ltd., 1986. 4. Provision Per/05/Men/1985 about lift and transport aircraft. 5. Provision no. Per/04/Men/1985. Aircraft Power and Production 6. T. D. Morton, <i>Motor Engineering Knowledge for Marine Engineers, Volume II</i> Sunderland and London, Thomas Reed Publications Ltd., 1978. |
| 32. | Industrial Waste Management | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to explain and understand the basics of waste management. 2. Students are able to distinguish the B3 waste (hazardous and toxic materials) and non B3. 3. Students are able to understand the basics of industrial waste. 4. Students are able to apply aspects of the Occupational Health and Safety in industrial waste management activities <p>Course Topics:</p> <ul style="list-style-type: none"> • Waste, including liquid, solid and gas waste. • Characteristics of B3 waste (hazardous and toxic materials) and non B3 • The basics of waste B3 management and non B3 • Basics of determining the type of waste treatment and waste processing building plan based on the characteristics to meet the applicable standard <p>References:</p> <ol style="list-style-type: none"> 1. Mara, D.D, <i>Sewage Treatment in Hot Climate</i>, John Wiley Chichester, 1976 2. Metcalf & Eddy, <i>Wastewater Engineering Treatment, Disposal, Reuse</i>, McGraw Hill Book Co, New York,1991 3. Marsono, B.D, <i>Teknik Pengolahan Air Limbah secara Biologis</i>, Media Informasi Alumni Teknik Lingkungan, ITS 4. Tchobanoglous, G., Thiesen, H., Eliassen, R., <i>Solid Waste Engineering Principles dan Management Issues</i>, McGraw hill Book Co, New York, 1977 5. Peavy, Howard S, <i>Environmental Engineering</i>, McGraw hill Book Co, New York, 1985 6. Wark, K., Warner, C.F., <i>Air Pollution, Its Origin and Control</i>, Harper |

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| | | | <p>& Row Publisher, New York, 1981</p> <p>7. Regulation on hazardous waste and toxic waste management.</p> <p>8. LaGrega, M..D., P.L. Buckingham, dan J.C. Evans, <i>Hazardous Waste Management</i>, McGraw Hill International Editions, New York, 1994</p> <p>9. Trihadiningrum, Y., <i>Pengelolaan Limbah B3 Buku Ajar, Due-like Project</i>, Jurusan Teknik Lingkungan FTSP-ITS, Surabaya, 2000</p> |
| 33. | English IV | 1/2 | <p>Objectives: Students are able to communicate using English in discussions/meetings and job application.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Presenting problems of technology in scientific discussion orally and in writing • Participate in meetings / discussions of scientific • Writing job applications and curriculum vitae • Interview <p>References:</p> <ol style="list-style-type: none"> 1. Goodale, Malcolm, <i>The Language of meetings</i>, Jakarta : PT. Gramedia Pustaka Utama 2. Ricahards, J.C. dan Bycina, David, <i>Person to person : Communicative speaking dan Listening skills</i> 3. Bramham, John dan Cox, David, <i>Job Hunting Made Easy : A step by step guide</i>, London : Kogan Page Limited. |
| 34. | Ergonomics | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to explain and understand the basic knowledge of Ergonomics and Work function 2. Students are able to design an application with the relationship between equipment design ergonomics human (labor) 3. Students are able to do design work (job design) in an effort approach in restructuring work <p>Course Topics:</p> <ul style="list-style-type: none"> • Introduction to Ergonomics and Work function • Body anthropometric and biomechanics • Calorie Consumption for physical workers • Application of Ergonomics in the Workplace • Posture and working facilities, lighting and décor • The design of shift work, relationships and health ergonomics • Evaluate the suitability of the design (ergonomics) between human and equipment design • Application to the design of statistical and dynamic display • Application system design industrial manufacture • Applications on organizational design and management • Human Factors <p>References:</p> <ol style="list-style-type: none"> 1. E. Granjean, <i>Fittng The Task To The Man : An Ergonomics Approach</i>, 1982 2. Sritomo Wignjosoebroto, <i>Ergonomi : Studi Gerak dan Waktu</i>, 1995 3. Eko Nurmiyanto, <i>Ergonomi : Konsep Dasar & Aplikasinya</i>, 1998 4. Ralph M. Barnes, <i>Motion & Time Study : Design & Measurement of work</i>, 1980 |

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| 36. | Working Environment Measurement (Practical) | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to take measurements of physical factors in working environment 2. Students can analyze the results of measurements in working environment 3. Students can recommend control measures with appropriate work environment based on the results of the measurement and analysis of measurement results <p>Course Topics:</p> <ul style="list-style-type: none"> • Perform general ventilation measurements, analyze the needs of general ventilation in the workplace, and make the draft general ventilation • To measure the gas detector and analyze the measurement results • To measure the working climate, analyzing the measurement results, make adjustments to the calculation of <i>ISBB</i>, and performs timing analysis work, workload and control recommendations • Conduct mapping work space, measurement noise in the workplace, as well as noise mapping • To measure the lighting in the workplace, do the mapping measurements, as well as designing the lighting in the workplace • To measure mechanical vibration on the engine, analyze the results of vibration measurement, as well as recommendations for improvement <p>References:</p> <ol style="list-style-type: none"> 1. <i>Kesehatan kerja & pencegahan kecelakaan</i>, Dr.Suma'mur P.K. Msc 2. <i>Threshold Limit Value fo Physical dan Chemical Substances and Biological Exposure Indices</i>, ACGIH, 2005, ACGIH-USA 3. <i>Industrial safety and health management</i>, 4th edition, C.Ray Ashfal, 1999, McGrawhil 4. Hand Out " <i>Heath and Safety Works Practice</i> " by Curtin University |
| 37. | Electrical Engineering (Practical) | 2/4 | <p>Objectives:</p> <p>Students are able to understand, explain the principles and operation of electrical measuring equipment and understand the legal concepts and electrical systems properly.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • The use of analog and digital meters • Understanding of electrical drawing • Installation of electric lighting installations • Low voltage distribution panel • Measurement of insulation resistance • Loss of voltage • Control of motor protection (DOL, Star Delta) <p>References:</p> <ol style="list-style-type: none"> 1. PUIL 2000 2. A.E. Fitzgerald, David E.H., <i>Basic Electrical Engineering</i>, 1975. 3. A.R. Margunadi, <i>Dasar-dasar Teori Rangkaian</i>. 4. GTZ Gmbh, <i>Electrical Engineering Basic Technology</i>. 5. William D. Cooper, <i>Instrumentasi Elektronik and Teknik Pengukuran</i> 6. Kingsly C.Ftzgerald A.E, Kusto A, <i>Electrical Machinery</i>, Mr-Graw Hill 1971 7. Wolfgang Muller, <i>Electrical Power Engineering Proficiency Course</i> 8. Ewar J.D, <i>Electrical Machinery</i>, Macmillan Education Ltd 1986 |

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| 38. | Prevention and Fire Fighting (Practical) | 2/4 | <p>Objectives: Students are able to understand and practice fire prevention, able to perform well in an emergency/non-emergency evacuation (especially when there is a fire)</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Principles of fire fighting techniques • Efficient Fire extinguisher Practice (APAR) • Practice of Fire detection & alarm system • Practice of fire hydrant Instalation • Automatic Fire Installation Practice (Integrated System) • Practice of Emergency & Evacuation Facility • Practice of Chemicals Fire Control • Practice of Evacuation <p>References:</p> <ol style="list-style-type: none"> 1. Cote, Arthur E, P.EN Jim L Linfille 1991 <i>“Fire Protection Handbook, Seventeenth Edition, NFPA Quincy , Massachusetts.</i> 2. <i>Chemical Proses Safety Fundamentals With Applications</i> (Daniel A. Crowl/Joseph F. Lowar) 3. Ministry of Labor – UNDP – ILO, Ins/84/012, 1987, Bahan Training keselamatan kerja penggulangan kebakaran , Jakarta 4. Directorate of Technical Supervision, Ministry of Public Works (1980), Guidelines for Fire Hazard Reduction using automatic sprinkler system waterFederal Emergency, Management Agency, US Department of Transportations, US Environmental Protection Agency, Handbook of Chemical Hazard Analysis 4. NFPA: 2000 Edition-One Batterymarch Park Quincy Massachusetts 5. Permenaker 04/Men/1980 tentang syarat-syarat pemasangan dan pemeliharaan APAR 6. Praptono Kartono (1989), Pencegahan dan Penanggulangan Kebakaran pada bangunan – bangunan, Jakarta. |
| 39. | Steam Aircraft and Pressure Vessel (Practical) | 2/4 | <p>Objectives: Students are able to identify provisions related to planning; manufacture; assembly; application, in order to save, protect and report procedures for handling Steam Aircraft and Pressure Vessel.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Definition & Glossary of Boiler and Pressure Vessel • Types of Boiler • The cause of Blasting Boiler • Preparation of Boiler Inspection and Testing • Dangerous sources of Pressure Vessel • Practical Technical Knowledge of Pressure Vessel • Technical administration of safety on Steam aircraft and Pressure Vessel • Surveillance on Steam Aircraft & Pressure Vessel Repair <p>References:</p> <ol style="list-style-type: none"> 1. T. D. Morton, <i>Motor Engineering Knowledge for Marine Engineers</i>, Edisi II Sunderland and London, Thomas Reed Publication Ltd, 1978. 2. L Jacson and T. D. Morton, <i>Motor Engineering Knowledge for Marine Engineers, Edisi IV</i>, Sunderland and London, Thomas Reed Publication Ltd, 1986. 3. Djokosetyardjo, MJ, PT Pradnya Paramita, Jakarta, 1999. |

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| 40. | Welding Technology | 1/2 | <p>Objectives: Students are able to understand and explore the operation of hand welding and gas welding technology.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • The history and development of welded metal • Types of welding and cutting • Hand welding, gas welding, soldering, brazing, • HAZ and MIG welding / MAG and Electric Arc Welding <p>References:</p> <ol style="list-style-type: none"> 1. ASME, Section IX 2. G.A. Kenedy, <i>Welding Technologi, 2nd ed</i>, the Bobbs Meril Company, Inc, 1982 3. AWS, Welding Handbook 4. Cary,HB, <i>Modern Welding Technology, 2nd ed</i>, Praticce Hall, Englewoods clifts,1989 5. H. Wiryosunarto dan Okumura, <i>Teknologi Pengelasan Logam</i> , PT Pradnya Paramitha, Jakarta 1991. |
| 41. | Combustion Engine- Practical | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students can operate and maintain the primary diesel engine. 2. Students can operate and maintain boilers, steam turbines, steam engine <p>Course Topics:</p> <ul style="list-style-type: none"> • Explain main treatment plant and auxiliary diesel engine. • Describe the work principles of high pressure fuel pump, air start. • Describe the system of reversing the direction of rotation axis of the main diesel engine. • Explain the working and function of the thrust block/reduction gear/gearbox • Describe the force and moment acting on the piston, connecting rod and crankshaft. • Describe the turbo charger and kind of system. • Describe nok diagram, speed boats, speed propeller, and slip. • Explains how to anticipate disorders that occurs in main diesel engine. • Describe the maintenance, operation, calculate the characteristic: the installation of boilers, steam turbines, steam engine and, calorimeters. <p>References:</p> <ol style="list-style-type: none"> 1. T. D. Morton, <i>Motor Engineering Knowledge for Marine Engineers, 2nd edition</i> Sunderland and London, Thomas Reed Publication Ltd, 1978. 2. L Jacson and T. D. Morton, <i>Motor Engineering Knowledge for Marine Engineers, 4th edition</i>, Sunderland and London, Thomas Reed Publication Ltd, 1986. 3. Mechanical oleh Tim BPLP Semarang. 4. Setyardjo MJ Djoko, <i>Ketel Uap</i>, PT Pradnya Paramitha, Jakarta, 1999. |
| 42. | Chemical Safety | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to explain and understand the basic knowledge of chemical safety norms 2 Students are able to know the dangerous sources of in Chemistry 3. Students are able to control the dangerous sources in the field of |

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| | | | <p>Chemistry</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Types of Hazardous Chemicals • Factors that affect the level of danger • The impact of chemicals on health and toxicology • The basic principles of prevention and control of chemical • Organizational and administrative handling of chemicals • Standard usage and Storage of Chemicals • Blasting and fire prevention, emergency response systems, and consequences analysis of hazardous materials release into the environment • Safety in limited work space <p>References:</p> <ol style="list-style-type: none"> 1. OSHA, NFPA and ANSI Standards 2. Hand Out of Course "Chemical Safety" University of Wisconsin 3. Ministry of Manpower and Transmigration "<i>Training Material of Safety and Health Sector</i>" 4. Regulation No. SE. 07/MEN/1997 about NAB chemical factors in the workplace air. 5. F.Joseph, A. Crowl Daniel, <i>Chemical Process Safety Fundamentals with Application</i> 6. <i>Confined space entry and emergency response</i>, D.Alan V, et al, 2002, McGrawhill |
| 43. | Electrical Safety | 2/4 | <p>Objectives:</p> <p>Students are able to understand electrical hazards, identify sources of hazards and apply safe system against electrical hazards</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Hazard of Electricity • Source of Electrical Hazard • Control of Electrical Hazard • LOTO (Lock Out Tag Out) • Measurement Safety • Personal Protective Equipment • Safe Work Practice • PUIL 2000 • Lightning Protection System • Lift Safety • Static Electricity • Electric Common Violation • Electrical Inspection <p>References:</p> <ol style="list-style-type: none"> 1. Compilation on OHS Regulations, 2003 2. OSHA training 2003 3. Willie Hammer, <i>Occupational Safety Manajement and Engineering</i>, Prentice Hall, 2001 4. David L. Goetsch, <i>Occupational Safety and Health for technologist, Engineer, and Managers</i>, Prentice Hall 2002 5. PUIL 2000 6. Djokosetyardjo, <i>Mesin Pengangkat I</i>, Pradnya Paramita, 1990 7. Ministry of Manpower and Transmigration "Training Material of Safety and Health Sector" |

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| 44. | Ergonomics (Practical) | 2/4 | <p>Objectives: Students are able to apply all principles and concepts of ergonomics and physiological work in designing and analyzing systems of work, especially human interaction into facilities and the workplace.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Design and analyze anthropometric of body, head, hands and feet. • Design and analyze biomechanics & Grip Strength • Measuring and analyzing human physiological performance • Measuring work activities directly and indirectly • Design and analyze Work Map of a work process • Designing and developing ergonomic product design • Designing application system on industrial manufacture design <p>References:</p> <ol style="list-style-type: none"> 1. Modul Ergonomics Practical. 2. E. Granjean, <i>Fittng The Task To The Man : An Ergonomics Approach</i>, 1982 3. Sritomo Wignjosoebroto, <i>Ergonomi : Studi Gerak dan Waktu</i>, 1995 4. Eko Nurmianto, <i>Ergonomi : Konsep Dasar & Aplikasinya</i>, 1998 5. Ralph M. Barnes, <i>Motion & Time Study : Design & Measurement of work</i>, 1980 |
| 45. | Risk Management & Reliability | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to understand and explain the concepts of reliability, reliability modeling and find the relationship between the reliability of the components and reliability system. 2. Students are able to use the concept of reliability to arrange scheduling treatments, find the relationship between reliability, abilities and availability in order to implement maintenance management. 3. Students are able to identify hazards and risks, understand the criteria of risk and risk management functions. 4. Students are able to perform risk analysis (assessment of risk level). 5. Students are able to explain the background of the importance of risk management in order to control the risk. <p>Course Topics:</p> <ul style="list-style-type: none"> • Understanding about Risks and Risk Management • Risk Management Standard (AS / NZS 4360:2004) • Concept of Probability, Severity, and risk assessment • Reliability Concepts • Introduction of the distribution and the probability of failure • Reliability systems (series, parallel, etc.) • Methods of Fault Tree Analysis and Failure Mode and Effect Analysis • Mean Time To Failure • Definition of treatment • Application of reliability in risk management • The introduction of Maintenance management • Maintenance Scheduling • Risk Based Inspection • Monte Carlo Simulation • Marcov Chain <p>References:</p> <ol style="list-style-type: none"> 1. <i>Guidelines For Hazard Evaluation Procedures, 2nd Edition</i> with Worked Examples 2. <i>Reliability and Risk Analysis, A Practical Guide.</i> |

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| | | | <ol style="list-style-type: none"> 3. <i>Risk Management Standard, AS/NZS 4360 : 2004</i> 4. <i>Operational Risk Management</i> 5. Lewis, E.E, <i>Introduction to Reliability Engineering</i>. John Willey, New York, 1994 6. Smith C.O, <i>Introduction to Reliability in Design (2nd Edition)</i>. McGraw-Hill, New York, 1975 |
| 47. | First Aid | 3/6 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to explain and understand the basic knowledge of first aid. 2. Students are able to analyze the case of an injury accident and make conclusions. 3. Students are able to perform first aid. <p>Course Topics:</p> <ul style="list-style-type: none"> • Definition of First Aid • The purpose and benefits of First Aid • Introduction to basic First Aid • Introduction to vital signs of life • Assessment of Patients • Physical Examination • Back Trauma Skills • Extremity Trauma Skills • Abdominal Trauma Skills • Shock Evaluations • Head Trauma Skills • Trauma In Pregnancy • Management of poisoning victims • Management of overdose victims • Management of accident with a large number of victims. • Provision of Cardiovascular and Pulmonary Resuscitation (CPR) <p>References:</p> <ol style="list-style-type: none"> 1. John Emory Campbell, <i>Basic Trauma Life Support, Prentice Hall, Upper Saddle River, New Jersey, 1998.</i> 2. Palang Merah Indonesia, <i>Pedoman Pertolongan Pertama</i>, Edisi Kedua, Kantor Pusat Palang Merah Indonesia, 2003. 3. Bergeron, J. David, <i>First Responder</i>, Fifth Edition, Prentice Hall, Upper Saddle River, New Jersey. <p>www.elsevier.com/locate/resuscitation, <i>European Resuscitation Council for Resuscitation</i>, 2005</p> |
| 48. | Welding (Practical) | 2/4 | <p>Objectives:</p> <p>Students are able to do welding and master hand and gas welding technology.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • The history and development of welded metal • Types of welding and cutting • Hand welding, gas welding, soldering, brazing, • HAZ and MIG welding / MAG and Electric Arc Welding <p>References:</p> <ol style="list-style-type: none"> 1. ASME, Section IX 2. G.A. Kenedy, <i>Welding Technologi</i>, 2nd ed, the Bobbs Meril Company, Inc, 1982 3. AWS, <i>Welding Handbook</i> 4. Cary,HB, <i>Modern Welding Technology</i>, 2nd ed, Praticce Hall, |

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| | | | Englewoods cliffs,1989 5. H. Wiryosunarto dan Okumura, <i>Teknologi Pengelasan Logam</i> , PT Pradnya Paramitha, Jakarta 1991. |
| 49. | Assignment: Fire Prevention Planning System | 3/6 | <p>Objectives: Students can design a Fire Prevention Planning System Application as in OHS fire prevention norms</p> <p>Course Topics;</p> <ul style="list-style-type: none"> • Efficient Fire extinguisher (APAR) • Detection system & Fire alarm • Fire hydrant Instalation • Installation of Sprinkler • Installation of Automatic Fire (Integrated System) • Emergency & Evacuation Facility • Applicative design on Fire Fighting System • Emergency Response and Preparedness System • Chemicals Fire Control <p>References:</p> <ol style="list-style-type: none"> 1. Cote, Arthur E, P.EN Jim L Linfille 1991 "Fire Protection Handbook, Seventeenth Edition, NFPA Quincy, Massachusetts. 2. Chemical Process Safety Fundamentals With Applications (Daniel A. Crowl / Joseph F. Lowar) 3. Department of Labor - UNDP - ILO, Ins/84/012, 1987, Safety Training Materials penggulangan fire, Jakarta 4. Directorate of Technical Supervision, Dep. PU (1980), Guidelines for Fire Hazard Reduction using automatic sprinkler system water 5. Federal Emergency, Management Agency, U.S. Department of Transportations, U.S. Environmental Protection Agency, Handbook of Chemical Hazard Analysis 6. NFPA: 2000 Edition-One Batterymarch Park Quincy Massachusetts 7. Permenaker 04/Men/1980 terms of installation and maintenance of fire extinguisher 8. Praptono Kartono (1989), Fire Prevention and Control in buildings - buildings, Jakarta. 9. SNI related system design fire in the building / buildings |
| 50. | Environmental Safety | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to explain and understand the EIA (Environmental Impact Assessment) and Environmental Management System 2. Students are able to prepare the EIA study based on applicable legislation and the Environmental Management System (ISO 14000) <p>Course Topics:</p> <ul style="list-style-type: none"> • History of EIA development, environmental aspects associated with EIA from interdisciplinary science • EIA underlying legislation includes provisions mandatory EIA activities and the preparation of technical guidelines for EIA • Drafting legislation of Environmental Management Effort (<i>UKL</i>) and Environmental Monitoring Effort (<i>UPL</i>) • Fundamentals of preparing an Environmental Management System (ISO 14000) and certification process <p>References:</p> <ol style="list-style-type: none"> 1. Chalid Fandeli, <i>Analisis Mengenai Dampak Lingkungan Prinsip Dasar dan Pemapannya dalam Pembangunan</i>, Liberty Yogyakarta, 1992 |

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| | | | <ol style="list-style-type: none"> 2. Bejis Aus-AID, <i>Analisa Dampak Sosial Dan Partisipasi Masyarakat dalam Pelaksanaan AMDAL</i>, Bapedal Propinsi Jawa Timur, 2002 3. Law No. RI. 4 Year 1982 on Basic Provisions of Environmental Management 4. Decree of the Minister of Environment No.. 86 Year 2002 on Guidelines for Environmental Management and Monitoring Living Environment 5. Regulation of Bapedal No. 9 Year 2000 on Guidelines for Preparation of EIA 6. ISO 14001 : 2004 Environmental Management System Specification with Guidance for use |
| 51. | Research Methodology | 1/2 | <p>Objectives: Students are able to create the scientific writing based on the rules of research writing.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Philosophy of science and its relation to scientific research. • The basic methods of research. • Principles of scientific research and its process. • Approach and scope of the study. • Fundamentals statistics for research. • Preparation of research framework and research proposal <p>References:</p> <ol style="list-style-type: none"> 1. Masri Singarimbun & Sofyan Effendi , <i>Metode Penelitian Survey</i>, Gajah Mada University Press, 1998. 2. Universitas Terbuka, Dpdikbud, <i>Metodologi Penelitian Materi Dasar Pendidikan Program Akta Mengajar V</i>, Jakarta, 1995. |
| 52. | Accident Analysis and Investigation | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to perform calculations of accident rate 2. Students are able to analyze and investigate accidents 3. Students are able to report the number of accidents and accident investigation <p>Course Topics:</p> <ul style="list-style-type: none"> • Conduct accident rate calculation with formula: <i>frequency rate, severity rate, Incidence rate, Sentinel accident, Injury incidence rate, Illness incidence rate, Lost workday cases incidence rate (LWDI), Number of lost workday rate</i> • Analyze accidents and accident investigation, conduct root cause analysis • Report on the number of accidents and accident investigation <p>References:</p> <ol style="list-style-type: none"> 1. <i>What went wrong</i>, Trevor Kletz, 1999 2. <i>Supervisor safety manual</i>, NSC, 1999 3. <i>Still going wrong</i>, Trevor Kletz, 2001 4. <i>Peraturan perundangan K3</i>, Pungki W, 2004 5. <i>Industrial loss prevention</i>, HW.Heinrich, 1988 6. <i>Industrial safety and health management</i>, 4th ed, C.Ray asfahl, 1999 |
| 53. | Mining Safety | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to understand and have knowledge about the function of Safety in Mines 2. Students are able to explain the background and causes of the accident at mining |

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| | | | <p>3. Knowing how to prevent and control accidents in mining area</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • various factors causing accidents in mining • various ways to prevent the occurrence of accidents in mining • how to analyze accidents in mining • various safety tools and personal protective equipment in mining <p>References:</p> <ol style="list-style-type: none"> 1. Handbook of Education, Education Program S1 and D3, School of Public Health, University of Airlangga, 2001/2002 2. PNKK, Association of Regulations |
| 54. | Communication | 1/2 | <p>Objectives:</p> <p>Students know the definition and communication theory, processes and elements of communication, behavior changes, and the role of communication in the field of occupational health and safety. Students are able to communicate effectively.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Introduction to communication science • Communication Between Personal (Principles of communication and perception, verbal and non-verbal communication) • Psychology of Communication (group communication, leadership) • Organization Communication (personal opinion in organization, communication within the organization) • Business Communication (Public speaking, Business writing) • Public Relations (PR as strategy to communicate with internal and external organizations) • Mass Communication (Mass Media Relations) • Journalism (journalistic product management) • Marketing Communications (Brand Image) • Consumer Behavior (Consumerism & Social Marketing) <p>References:</p> <p>-</p> |
| 56. | Occupational Health and Safety Inspection | 2/4 | <p>Objectives:</p> <p>Students are able to conduct OHS inspections in all type workplaces, and develop the results of the inspection on the real conditions on the ground</p> <p>Course Topics:</p> <ol style="list-style-type: none"> 1. Developing Inspection forms 2. Conducting inspections in the field 3. Developing Inspection results <p>References:</p> <ol style="list-style-type: none"> 1. STOP for supervision Du Pont 2. <i>Occupational safety management and engineering</i>, Willie hammer,2001 3. <i>An introduction to Reliability and maintainability</i>, Charles E.Ebeling,1997 |
| 57. | Maritime Safety | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to understand and have knowledge about the function of Maritime Safety (Naval) 2. Students are able to explain the background and causes of accidents in the maritime 3. Students can find out how to prevent and control accidents in |

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| | | | <p>maritime field</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Regulation of maritime safety • Regulation of Classification Bureau Indonesia (BKI) • Regulation on safety shipping at sea (SOLAS = international regulations) • International marine law <p>References:</p> <ol style="list-style-type: none"> 1. Handbook of Education, Education Program S1 and D3, School of Public Health, University of Airlangga, 2001/2002 2. Muchtar Kusumaatmaja, <i>Hukum Laut Internasional</i> 3. PNKK, Compilation of OHS Regulations, Ministry of Manpower and Transmigration 4. SOLAS, BKI |
| 58. | Process Safety | 2/4 | <p>Objective: -</p> <p>Course Topics:</p> <ol style="list-style-type: none"> 1. Engineering Philosophy and Process Safety 2. Process safety 3. Process Safety Management 4. Hazard and Process-Risk Management 5. Documentation and Information of Process Safety 6. Amendment Management 7. Safety Instrumentation System 8. Process Safety Audit 9. Process Safety in Engineering and Design <p>References:</p> <ol style="list-style-type: none"> 1. <i>Guidelines for Auditing Process Safety Management Systems</i>, CCPS, AIChE, 1993 2. <i>Guidelines for Implementing Process Safety Management Systems</i>, CCPS, AIChE, 1994 3. <i>Guidelines for Preventing Human Error in Process Safety</i>, CCPS, AIChE, 1994 4. <i>Guidelines for Process Safety Documentation</i>, CCPS, AIChE, 1994 |
| 59. | Safety on Building Construction Sector | 2/4 | <p>Objectives:</p> <ol style="list-style-type: none"> 1. Students are able to explain and understand the basic knowledge of safety norms in building construction area 2. Students are able to know dangerous sources in the area of building construction 3. Students are able to control dangerous sources in the field of building construction <p>Course Topics:</p> <ul style="list-style-type: none"> • Scope of Safety on Building Construction • Common Understanding • Technical requirements on Building Construction Industry • Sources of Danger • Prevention & Abatement <p>References:</p> <ol style="list-style-type: none"> 1. Departemen Tenaga Kerja dan Transmigrasi RI “<i>Training Material K3 Bidang Konstruksi Bangunan</i>” 2. Hand Out of Course “<i>Safety in The Construction Industry</i>” University of Wisconsin 3. Keb Bersama Menaker dan PU Kep. 104/kpts/1986 4. Permenaker RI Per. 01/Men/1980 |

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| | | | <p>5. Permenaker RI Per. 01/Men/1989</p> <p>6. Praptono Kartono (1989), <i>Pencegahan dan Penanggulangan Kebakaran pada bangunan – bangunan</i>, Jakarta.</p> |
| 60. | Industrial Psychology | 1/2 | <p>Objectives: Students are able to explain and understand the principles of Professional Ethics.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Principles of professional ethics • Regulation no. 23 year 1992 related to professional ethics <p>References:</p> <ol style="list-style-type: none"> 1. Sprigel, William R and Lanaburgh H, <i>Industrial Management</i>, New York: John Wiley and sons 2. PNKK, Compilation of OHS regulations, Ministry of Manpower and Transmigration |
| 61. | On the Job Training | 12/40 | <p>Objectives: Students are able to increase knowledge in technology application, especially in association with occupational health and safety technology at the company/industry or shipyards industry in accordance with the knowledge gained in class.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Industrial Management (<i>SMK3</i> in Industry) • Health and safety in the Industry • PPC • Implementation in the field; includes welding mechanical design, repair, measurements and testing, equipment production, OHS equipment and preparing reports. <p>References:</p> <ol style="list-style-type: none"> 1. K. Suma'mur P, <i>Keselamatan Kerja dan Pencegahan Kecelakaan</i>, Gunung Agung Jakarta. 2. Sofyan Assantri, <i>Manajemen Produksi</i>, UI, 1978 3. Ishikanta Kamru, <i>Pedoman dan Pengendalian Mutu</i>, Alih Bahasa Hasil tamsil 1983 |
| 62. | Quality Control | 1/2 | <p>Objectives: Students understand the concept of modern understanding of quality and its role as one of the strategic dimension of the company and be able to apply methods of statistical quality control to monitor the quality control process</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Definition of Quality • The use of statistics to control quality • Quality costs • Total Quality Management <p>References:</p> <ol style="list-style-type: none"> 1. Eugene L. Grant, Richard S. Leaveenworth, Hundaya Kandahjaya, <i>Pengendalian Mutu Statistik</i>, Alih bahasa Erlangga 1993. 2. Dale H. Besterfield, PhD. <i>Quality control</i>, fourth Edition, Prentice Hall, International, Inc.1994 |
| 63. | Information System | 2/4 | <p>Objectives: Students are able to understand and explain the basics of the formation of Information System.</p> |

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| | | | <p>Course Topics:</p> <ul style="list-style-type: none"> • Fundamentals of Information Systems • Solve business problems with Information Systems • Hardware, Computer Software and Telecommunications • Database Management • Internet and E-Commerce • Extranet and Enterprise Collaboration • Information Systems for Business Operations • Information Systems for Managerial Decision Making • Information Systems for Strategic Advantage • Enterprise and Global Management • Influence of Ethics and Social Information Systems <p>References:</p> <ol style="list-style-type: none"> 1. Kenneth C. Laudon, <i>Management Information Systems : New Approaches to Organization and Technology</i>, Fifth Edition, Prentice Hall Inc., 1998. 2. James A. O' Brien, <i>Management Information Systems : Managing Information Systems</i>, Fourth Edition, McGraw- Hill Companies, Inc., 1999. 3. Raymond McLeod, Jr., George Schell, <i>Management Information System, Eight Editions</i>, Prentice Hall Inc., 2001. 4. Steven Alter, <i>Information Systems : Foundation of E-Business</i>, Fourth Edition, Prentice Hall, 2002. 5. Carrol W. Frenzel, John C. Frenzel, <i>Management Information System, Fourth Editions, Course Technology</i>, Thomson Inc., 2004. |
| 64. | Thesis | 5/10 | <p>Objectives:</p> <p>Students are able to apply their knowledge in the form of a report, as gained in class or laboratory. Students are expected to design and plan safety system in the workplace.</p> <p>Course Topics:</p> <ul style="list-style-type: none"> • Planning and mockup (project work) on safety system • Objects/tools Testing • Analysis of case studies • Reporting Preparation <p>References:</p> <ol style="list-style-type: none"> 1. "Bahan Penataran Metodologi Penelitian", Pusat Penelitian ITS, Surabaya 1989. 2. <i>Kesehatan kerja & pencegahan kecelakaan</i>, Dr.Suma'mur P.K. Msc 3. General operational guidance module of P2K3 Department of Labor, Indonesia, year 1998/1999 4. Hand Out "Health and Safety Works Practice " by Curtin University |