

Module Handbook of Bachelor of Environmental Engineering

The **Module¹ Handbook** or **complete collection of module descriptions** serve as a **key tool** for the assessment of your study programmes. In addition, **their primary purpose** should be to serve as a **reliable source of information for students**. They should therefore be made available to students in the **course language** and **translated into English** for the assessors. A module description should contain the following information about the module:

Semester I

Module designation	Islamic Religion
Semester(s) in which the module is taught	1
Person responsible for the module	MKWU Lecturer Team
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lectures, discussions, exercises, assignments
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students can understand various ways to strengthen faith and piety and develop noble character and make Islamic teachings the basis for thinking and behaving in professional development.
Content	This course discusses: a) The concept of God in Islam, faith and piety, the implementation of faith and piety in modern life, b) Human nature according to Islam, understanding of law, human rights, and democracy in Islam, Islamic law and the contribution of Indonesian Muslims, c) Ethics, morals and morals, science and art in Islam, d) Inter-religious harmony, civil society and the welfare of the people, Islamic economics, Islamic culture, and the Islamic political system.
Examination forms	Written test, oral presentation, and essay
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Abdushshomad, Muhammad Kamil. 2002. Scientific Miracles in the Qur'an. Akbar.

¹ "Modules" are units of instruction, composed of a sum of teaching and learning whose contents are concerted. In some countries, modules may be known as "courses".

	<p>2. Al Hasani, Muhammad Alawy Al Maliki. 1424 H. Extreme in Religious Thought, Its Influence on the Emergence of Terrorist and Anarchist Acts. Makkah al Mukarromah.</p> <p>3. Hasymy. 1989. Why the Qur'an does not contradict reason. PT Bulan Bintang. Jakarta.</p>
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Module designation	Catholic Religion
Semester(s) in which the module is taught	1
Person responsible for the module	MKWU Lecturer Team
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lectures, discussions, exercises, assignments
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students can understand various ways to strengthen faith and piety and develop noble character and make Catholic Christian teachings the basis for thinking and behaving in professional development.
Content	This course is a teaching subject that makes religion a source of value and guidance in the development of a Christian personality that upholds human dignity.
Examination forms	Written test, oral presentation, and essay
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	-

Module designation	Protestant Religion
Semester(s) in which the module is taught	1
Person responsible for the module	MKWU Lecturer Team
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lectures, discussions, exercises, assignments
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course

Module objectives/intended learning outcomes	Students can understand various ways to strengthen faith and piety and develop noble character and make Protestant Christian teachings the basis for thinking and behaving in professional development.
Content	This course is a course that makes religion a source of values and guidelines in the development of a Christian personality that upholds human dignity. This course is presented based on the components of the Competency-Based Curriculum (KBK), which consists of Competencies, Study Substance, Study Sub and the entire learning process including methodology and evaluation. The study substance is a topic that has been determined by the Directorate General of Higher Education through Decree No. 38/Dikti/Kep/2002.
Examination forms	Written test, oral presentation, and essay
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. J. Verkuyl. 1992. Christian Ethics - Race of Nation & State. Gunung Mulia. Jakarta. 2. J. Verkuyl, 2003. Christian Ethics in General. Mount Mulia. Jakarta.

Module designation	Hindu Religion
Semester(s) in which the module is taught	1
Person responsible for the module	MKWU Lecturer Team
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lectures, discussions, exercises, assignments
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	students have religious morality that underlies their academic attitudes and actions
Content	This course will invite students to deepen their understanding and appreciation, as well as strengthen their faith and rely on devotion to Sang Yang Widhi / God. In this course also given the understanding of the concept of Godhead (Brahma Widya), Catur Marga Yuga, Hindu Human Nature II, Ethics and Morality I, Ethics and Morality II, Science Technology in Hindu Perspective I, II, Religious Harmony, Jagadhita Working Society, Culture as an Experience of Hinduism, Politics in Hindu Perspective, Hinduism in the Framework of Upholding Justice.
Examination forms	Written test, oral presentation, and essay
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Atmaja, I.B. Punya. 1974. Panca Sradha. PHDI Center. Jakarta. 2. Compilation Team. 1998. Hindu Religious Education for Higher Education. Ministry of Religious Affairs Binbaga Hinduism. Jakarta. 3. Wiana. 1994. How Hindus Live God. Manikgeni. Bali.

Module designation	Buddhist Religion
Semester(s) in which the module is taught	1
Person responsible for the module	MKWU Lecturer Team
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lectures, discussions, exercises, assignments
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students can understand various ways to strengthen faith and piety and develop noble morals and make Buddhist teachings the basis for thinking and behaving in professional development.
Content	-
Examination forms	Written test, oral presentation, and essay
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	-

Module designation	Confucian Religion
Semester(s) in which the module is taught	1
Person responsible for the module	MKWU Lecturer Team
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lectures, discussions, exercises, assignments
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to understand various ways to strengthen faith and piety and develop noble character and make the teachings of Confucianism the basis for thinking and behaving in professional development.
Content	-
Examination forms	Written test, oral presentation, and essay
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module

Reading list	-
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Module designation	Pancasila
Semester(s) in which the module is taught	1
Person responsible for the module	MKWU Lecturer Team
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Learning activities are carried out in the form of structured lectures, which include lectures, public lectures, group presentations, group discussions, individual assignments in the form of public lecture reviews, article reviews, movie reviews, case studies, and preparation of national projects in groups.
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Able to respond to the actual problems of the nation and state, and apply the values of Pancasila in the life of the nation and society with the final achievements of students being able to: solve national problems related to Pancasila by making national projects as a contribution to improving the quality of life in society, nation, state, and progress of civilization based on Pancasila (C6, A2, P7).
Content	This course discusses: 1. Pancasila in the study of the nation's history, Pancasila as the basis of the state, 2. Pancasila as a state ideology, 3. Pancasila as a system of philosophy, 4. Pancasila as a system of ethics, 5. Pancasila values as the basis for science development, The meaning of the Precepts of Pancasila, and examples of application in the life of the nation and society.
Examination forms	Written test, oral presentation, group assignments, and essay
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Latif, Yudi, 2009, Negara Paripurna, Actuality and Historicity of Pancasila, Jakarta: Gramedia 2. Latif, Yudi, 2014, Springs of Exemplary, Pancasila in Action, Bandung: Mizan 3. Tim Dikti, 2016, Pancasila Education Module for Higher Education, Jakarta: Kemenristekdikti

Module designation	Civic
Semester(s) in which the module is taught	1

Person responsible for the module	MKWU Lecturer Team
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lectures, discussions, exercises, assignments, writing, and presentations.
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	students are able to analyze contextual issues of nationality, by developing a positive attitude and displaying behavior as a reflection of: (i) national spirit and love for the country, (ii) democracy with dignity, and (iii) awareness of law and diversity by utilizing the integrated MKWU UNAIR module through written and online media through AULA (elearning.unair.ac.id).
Content	This course discusses the material: (i) Civics Education as an orientation to strengthen (and strengthen) the character of the Indonesian Nation; (ii) national identity, Identity Politics, and Indonesian Nationalism; (iii) the State and the Constitution, the Relationship between the State and Citizens; (iv) Indonesian Democracy and Democracy Education in Indonesia, the Rule of Law and Human Rights; (v) Archipelago as Indonesian Geopolitics and National Resilience as Indonesia's Geostrategy in the realm of globalization; (vi) Regional Autonomy (Law on Villages). State Defense, and World Peace; (vii) National Integration; (viii) Anti-Corruption Education; and (ix) Tax Obedience.
Examination forms	Written test, oral presentation, group assignments, and essay
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Adib, Mohammad, Listiyono Santoso, and Ajar Triharso. 2013. Pancasila and Citizenship Education: An Introduction to Building National Character. Surabaya: Airlangga University Press. 2. Adib, Mohammad. 2016 (Second Cet.). Build the Soul, Build the Nation: Strengthening National Character in Civic Education Learning. Surabaya: Saga and Directorate of Education of Airlangga University. 3. Kemenristek Dikti, Directorate General of Learning and Student Affairs. 2016. Civic Education for Higher Education. (Cet. I). Directorate General of Higher Education. 4. Ministry of Education and Culture, Directorate General of Higher Education, 2010, Anti-Corruption Education for Higher Education, Jakarta: Ministry of Education and Culture. 5. Listiyono Santoso, et al. 2019. Integrated Module of MKWU Universitas Airlangga. MKWU-University of Airlangga

Module designation	Bahasa Indonesia
Semester(s) in which the module is taught	1
Person responsible for the module	Indonesian Language Course Team

Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lectures, discussions, exercises, assignments, writing, and presentations.
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	After participating in this study, students are able to apply good and correct Indonesian language usage, both in oral and written communication based on scientific rules and ethics by utilizing the integrated MKWU UNAIR module and written and online media through AULA (elearning.unair.ac.id).
Content	This course discusses materials: a) History, position, and function of Indonesian language, as well as integrated MKWU UNAIR modules, b) language varieties, c) spelling according to the General Guidelines for Indonesian Spelling (PUEBI), effective sentences, and paragraph development d) scientific essay writing (scientific essay systematics, citation techniques, bibliography techniques, and appearance in scientific essays), e) scientific presentations.
Examination forms	Written test, oral presentation, paper assignment, and essay
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Language Development and Guidance Agency. Ministry of Education and Culture. 2011. Law of the Republic of Indonesia Number 24 of 2009 concerning Flags, Language, and State Emblems, and National Anthem. 2. Directorate General of Learning and Student Affairs, Ministry of Research, Technology and Higher Education of the Republic of Indonesia. 2016. Indonesian Language General Compulsory Course Textbook. 3. Listiyono Santoso, et al. 2019. Integrated module of MKWU Universitas Airlangga. MKWU-University of Airlangga 4. General Guidelines for Indonesian Spelling. http://www.kemdikbud.go.id/main/blog/2016/01/salinan-permendikbud-nomor-50-tahun-2015 . 6. https://kbbi.kemdikbud.go.id/

Module designation	Data and Literature
Semester(s) in which the module is taught	1
Person responsible for the module	Dr. Diah Indriani, S.Si., M.Si.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lectures, Project-Based Learning.
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours

Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to use data and scientific references to make decisions and persuade
Content	This course aims to encourage students to learn to understand how to interpret and use data properly and responsibly, so that students can develop strong and coherent arguments, and equip students with the ability to evaluate the quality of other people's arguments. Not everyone will be a scientist who has to plan a research design, collect data, analyze it and draw conclusions, but data literacy will help students to make decisions in everyday life that are guided by data. In addition, students are encouraged to practice searching, reading, evaluating and sorting out claims or information contained in scientific literature. In this course, students are also given the opportunity to practice organizing scientific references with the help of a reference manager application.
Examination forms	Written test, quiz, Mini Literature Review
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Bailey, J. (2008). The first step in qualitative data analysis: creating transcripts. <i>Family Practice</i>, 25(2), 127-131. d 2. Bowen, M. & Bartley, A. (2014). <i>Fundamentals of Data Literacy</i>. Arlington: NSTA Press. 3. Davidson, C. (2009). Transcription: A necessity for qualitative research. <i>International Journal of Qualitative Methods</i>, 8(2), 35-52. 4. Durbin, C.G. (2009). How to read a scientific research paper. <i>Respiratory Care</i>, 54(10), 1366-1371. 5. Field, A. (2016). <i>Adventures in Statistics: The Riddle of Reality</i>. London: SAGE Publications. 6. Fosmire, A. (2013). How to read scientific papers. Purdue University Library. 7. Leonelli, S. (2020). Scientific Research and Big Data. <i>Stanford Encyclopedia of Philosophy</i>. 8. Students can get the most out of online searches. <i>The Conversation</i>. 9. 10. Pain, E. (2016). How to (seriously) read scientific papers. <i>Science Magazine</i>. 10. Zein, R.A. (2021). Political Psychology Research Methods. in W. Yustisia, M. A. Hakim, & R. Ardi (Ed.), <i>Political psychology</i> (pp. 33-74). Jakarta: Kompas Book Publisher.

Module designation	Basic of Biology
Semester(s) in which the module is taught	1
Person responsible for the module	Hari Soepriandono, S.Si. M.Si.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Learning activities are carried out in the form of structured lectures, which include lectures, group discussions, presentations and class discussions.

Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students in the first semester of Science and Technology are able to describe the principles of biology correctly and prove the application of biological principles to solve problems in life (C2, A3).
Content	Introduction to Biology, cell as a unit of life, cell metabolism, protein synthesis and replication, structure and function of plants and the relationship between plant structure and function, structure and function of animals and the relationship between animal structure and function, homeostasis at the cellular level, homeostasis at the organism level, grouping of organisms and conservation of biological resources, interaction of organisms and their environment, reproduction of cells and organisms, evolution at the gene, cell, and organism levels; modern biotechnology, biological information database, review of cases in the field of biology in the last 1 year.
Examination forms	Written test, quiz, Assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Campbell, NA, Reece JB, and Mitchell, LG, 2010. Biology, 9th edition. Pearson Education Inc. Toronto. 2. Campbell, N.A. & J.B. Reece, 2012. Biology, 8th edition. Benjamin Cummings, San Francisco. 3. Freeman. S. 2012. Biological Sciences: volume 2. Evolution, Diversity and Ecology, Prentice Hall Inc, New Jersey. 4. 5. Jones, M., & G. Jones. 2016. Advanced Biology, 10th Edition. Cambridge University Press Cambride. 5. Claverie, J. 2011. Bioinformatics for Beginners, 2nd Edition: Erlangga. For Dummies. 6. Fatchiyah. 2015. Basic Principles of Bioinformatics. UB Press Publisher. Malang.

Module designation	Basic of Chemistry
Semester(s) in which the module is taught	1
Person responsible for the module	Basic Chemistry 1 Teaching Team
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lectures, discussions, exercises, assignments, and presentations
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS

Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	students can identify carbon compounds deciphering the composition of matter, and can calculate quantitatively between reactants and products in chemical reactions.
Content	Atomic structure and periodic system; Chemical bonding: ionic bonding, covalent bonding, coordination bonding, hydrogen bonding; Stoichiometry; Redox and Thermochemistry; Reaction Rate; Reaction Equilibrium; Solutions: types and concentrations, colligative properties of solutions; Introduction to Organic Chemistry: Aliphatic Hydrocarbons (alkanes and cycloalkanes, alkyl halides) alkenes and alkynes, Aromatic Compounds; Alcohols and Ether
Examination forms	Written test, quiz, Assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Brady, J.E., 1992, General Chemistry, 5th edition, John Wiley and Sons, New York 2. Whitten, K.D., Davis, R.E., Gailey, K.D., 1992. General Chemistry with Qualitative Analysis, 4th ed. 4th, Saunders College Publ, USA. 3. Brown, W.H., 1982, Introduction to Organic Chemistry, 3rd Ed., Williard Grant Press, Boston. 4. Wilbraham, A.C., Matta M.S., 1992, Introduction to Organic and Biological Chemistry (translated by Suminar Achmad), Publisher of ITB.

Module designation	Lab Practice for Basic of Biology
Semester(s) in which the module is taught	1
Person responsible for the module	Biology lecturer
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture and practice
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Self-study = 1 hours 10 minutes
Credit points	1.6 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to practice basic skills for biological analysis correctly. Students are able to show the structure of animal and plant cells and tissues and their functions correctly, according to standard references.

Content	Introduction to microscopy, cell structure and function, physical activity of protoplasm. Biosystematics, plant structure and function, body structure of fish and amphibians. Microscopic structures in plants, and animals. The influence of the environment on the activity of the body. Working conditions of enzymes. The influence of physical factors in the environment on the activity of the cell reproduction body. Population sampling.
Examination forms	Written test and report
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Anonymous. Tt. Basic Biology II Practicum Manual. Department of Biology FMIPA Airlangga University. Surabaya. 2. Audesirk, T., Audersirk, G., and B.E. Byers, 2002. Biology: Life on Earth 6thEd. Prentice-Hall. New Jersey. 3. Farish, D.J., 1993. Human Biology, Jones and Bartlett Publisher. Boston. 4. Pianka, E.R., 2000. Evolutionary Ecology, 6thED. Benjamin Cummings. San Francisco. 5. Waite, S., 2000. Ecological Statistics in Practice, A Guide to Analyzing Environmental and Ecological Field Data. Prentice Hall.

Module designation	Lab Practice for Basic of Chemistry
Semester(s) in which the module is taught	1
Person responsible for the module	Chemistry lecturer
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture and practice
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Self-study = 1 hours 10 minutes
Credit points	1.6 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to explain the basic concepts of chemistry which include organic and inorganic compounds correctly.
Content	Chemical bonding experiments, reaction speed, molar volume, reduction and oxidation, determination of equivalent weight, introduction of elements (Hg^{2+} , Ag^+ , Pb^{2+} , K^+ , Na^+ , NH_4^+ , and Mg^{2+}), colligative properties, alcohols, phenols, ketones and aldehydes, ethane, ethene ethuna, and carboxylic acids.

Examination forms	Written test and report
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Barret, L. R. and price J., 1965, A Modern Course Laboratory Manual. Ohite Charles E. Merris Books 2. Kaiser, R.W. and Griffith, C. H., 1991. General Chemistry Laboratory Manual, 2nd ed.. Ginn Press. Kentucky. 3. Shalbert, S.L., Johnson, B.H. and Zrollfoolk, O.E., 1969, Experimental Chemistry: a Laboratory for Principles of Chemistry, 5th ed. 4. Plumber, O.R., 1978, An Introduction to practical Biochemistry, 2nd ed., Mc graw Hill Book Co. New York.

Module designation	Introduction to Environmental Science and Technology
Semester(s) in which the module is taught	1
Person responsible for the module	Environmental Engineering Lecturer
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lectures, discussions, exercises, assignments, and presentations
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	students are expected to gain an understanding of environmental science. In particular, students are expected to gain an understanding of: the relationship between population increase, natural resources and the environment.
Content	Definition of ecology, environment and environmental science, population growth, natural resources and pollution, ecological concepts, population, renewable and non-renewable natural resources, water pollution, air pollution, climate change and ozone layer depletion, solid waste and hazardous waste, maintaining biodiversity sustainability.
Examination forms	Written test, quiz, Assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module

Reading list	<ol style="list-style-type: none"> 1. Holdgate, M.W. 1980. A Perspective on Environmental Pollution. Cambridge University Press. Cambridge. 2. Kumar, H. D. 1997. General Ecology. Vikas Publishing House PVT Ltd. New Delhi. 3. Miller, Jr, G.T. 2002. Living in the Environment. Principles, Relationships and Solutions. Wadsworth Group. New York: Wadsworth Group. 4. Brooks/Cole. Thomson Learning. Australia. 4. Soegianto A. 2005. Environmental Science, Tools Toward a Sustainable Society. Airlangga University Press.
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SEMESTER II

Module designation	Introduction to Scientific Collaboration
Semester(s) in which the module is taught	2
Person responsible for the module	Dr. Hanik Endang Nihayati, S.Kep, Ns., M.Kep.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture, small group discussion, discovery learning, role play, e-learning
Workload (incl. contact hours, self-study hours)	<p>Lecture = 1 hours 40 minutes</p> <p>Assignment activities = 2 hours</p> <p>Self-study = 2 hours</p>
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to apply interdisciplinary collaboration and collaboration, foster cooperation based on competence in solving problems in social life in the form of health, social and humanities problems.
Content	<ol style="list-style-type: none"> 1) Motivation to build the character of cooperation and collaboration; 2) The concept of collaboration interprofessional education; 3) The basic concept of leadership and decision making; 4) Interdisciplinary communication and cooperation; 5) Collaborative communication; 6) Community concept; 7) Implementation of collaboration in the community 8) Project base learning IPE; 9) Community Project based on Interprofessional Education learning
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module

Reading list	<ol style="list-style-type: none"> 1. Hammick, M, Freeth, D, Koppel, I, Reeves, S & Barr, H, 2007. A Best evidence systematic review of interprofessional education: BEME Guide no 9 Med Teach, 29(8): 735 – 51. Doi 10.1080/01421590701682576 2. World Health Organization. 2010. Framework for action on interprofessional Education & Collaborative Practice. Diakses dari: whqlibdoc.who.int/hq/2010/WHO_HRH_HPN_10.3_eng.pdf 3. Bosh, B, dan Mansell, H, 2015. Interprofessional collaboration in health care Lesson to be learned from competitive sport. Can Pharm J (Ott), vol 148, no 4 pp 176-179 4. Interprofessional Education Collaborative Expert Panel, 2011 Core Competencies for interprofessional collaborative practice: Report of an expert panel. Washington, DC: Interprofessional Education Collaborative 5. Thistlethwaite J., Moran M, 2010 Learning Outcome for Interprofessional Care, 24(5), 503-515. http://dx.doi.org/10.3109/13561820.2010.483366
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Module designation	Logic and Critical Thinking
Semester(s) in which the module is taught	2
Person responsible for the module	Dr. Achmad Chusairi, M.A.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture, small group discussion, discovery learning, role play, e-learning
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	Data and Reference
Module objectives/intended learning outcomes	Students are able to conduct critical reviews of the developments and problems of modern science

Content	Examines the main philosophical questions regarding the nature of science, how science works, methods of obtaining science, and the implications of the development of modern science. This course also examine the position of science in the universe of philosophy and the role of philosophy in the debate on the basic rules of modern science. This course is directed at three main themes; first, exploring the difference between science and common sense, including its characteristics and methods of acquisition which are the subject of study in the philosophy of science. Second, examines major transitions in the philosophy of science tradition, namely falsification (Karl Raimund Popper) and paradigm change/scientific revolution (Thomas Kuhn). Third, examining classical debates in the philosophy of science, including the question of whether reality can be fully explained by science. How does historical contextuality influence the development of science? How has science succeeded (and failed) in transforming human civilization? Finally, students are invited to appreciate the practical implications that philosophy of science brings to a variety of modern research methodologies.
Examination forms	Written test, oral presentation, and essay
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Bird, A. (2018). <i>Thomas Kuhn</i>. The Stanford Encyclopedia of Philosophy. 2. Burns, P.B., Rohrich, R.J. & Chung, K.C. (2011). The levels of evidence and their role in Evidence-Based Medicine. <i>Plastic Reconstruction Surgery</i>, 128(1), 305-310. 3. Chakravartty, A. (2017). <i>Scientific Realism</i>. The Stanford Encyclopedia of Philosophy. 4. Fidler, F. (2018). <i>Reproducibility of scientific result</i>. The Stanford Encyclopedia of Philosophy. 5. Gaarder, J. (2014). <i>Dunia Sophie: Sebuah Novel Filsafat</i>. (Terj. Astuti, R.) Bandung: Penerbit Mizan. 6. Glanzberg, M. (2018). <i>Truth</i>. The Stanford Encyclopedia of Philosophy. 7. Hitchcock, D. (2018). <i>Critical Thinking</i>. The Stanford Encyclopedia of Philosophy. 8. Iaccarino, M. (2001). Science and Ethics. <i>EMBO Reports</i>, 15, 2(9), 747-750. 9. Jones, E.A. (2021). <i>Formal Logic</i>. 10. Knachel, M. (2021). What is logic? <i>Introduction to Philosophy: Logic</i>. 11. Schurz, G. (2014). <i>Philosophy of Science: A unified approach</i>. London: Routledge. 12. Smith, D.W. (2013). <i>Phenomenology</i>. The Stanford Encyclopedia of Philosophy. 13. Strevens, M. (2021). <i>Why Aristotle didn't invent modern science</i>. BigThink. 14. Sugiharto (2014). Filsafat dan pengalaman. Dalam J. Gaarder, <i>Dunia Sophie: Sebuah Novel Filsafat</i> (hal. 13-18). Bandung: Penerbit Mizan. 15. Thornton, S. (2021). <i>Karl Popper</i>. The Stanford Encyclopedia of Philosophy. 16. Merton's Norm and Scientific Ethos.

Module designation	Communication and Self-development
Semester(s) in which the module is taught	2
Person responsible for the module	Ajeng Rachma Pertiwi, S.E., M.S.A.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture, small group discussion, discovery learning, role play, e-learning
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> 1. Students able to understand and develop themselves and increase their learning capacity; 2. Students able to lead and work in teams; 3. Students able to improve the quality of the resources owned for organizational development, networking and being responsible for work according to professional ethics; 4. Students able to internalize values, norms, academic ethics, spirit of independence, struggle, and entrepreneurship according to the basic principles of the UNAIR academic community HEBAT and Excellent with Morality
Content	This course provides insight and opportunities for students to be able to explore their own potential in order to be able to develop and increase their own capacity through synergy with coaching activities in the Student Activity Unit and other student organization activities
Examination forms	Written test, oral presentation, role play, discovery learning,
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module

Reading list	<ol style="list-style-type: none"> 1. Covey, S. R. (2004). <i>The 7 habits of highly effective people: Powerful lessons in personal change</i>. Simon and Schuster. 2. Giuseffi, F. G. (Ed.). (2019). <i>Self-Directed Learning Strategies in Adult Educational Contexts</i>. IGI Global. 3. Falkheimer, J., & Heide, M. (2018). <i>Strategic Communication: an introduction</i>. Routledge. 4. ELIAS, N. C. (2020). <i>KNOW THYSELF</i>. Dr. NELSON C ELIAS 5. Purushothaman, R. (2021). <i>Emotional Intelligence</i>. SAGE Publishing India. 6. Reyes, M. (2020). <i>Social Empathy: The Art of Understanding Others</i>. 7. Lisa Reynolds, Ryan Ledger · 2020. <i>Assertive Confident Communication Skills A Guide to Better Social Skills Through Assertiveness, Effective Communication and Increased Confidence</i> 8. Tubbs, S. L. (2020). <i>Shared experiences in human communication</i>. Routledge. 9. Katz, N. H., Lawyer, J. W., Sweedler, M., Tokar, P., & Sossa, K. J. (2020). <i>Communication and conflict resolution skills</i>. Kendall Hunt Publishing. 10. Kumar, S. (2021). <i>Communication Skills and Soft Skills An Integrated Approach</i>.
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Module designation	Calculus
Semester(s) in which the module is taught	2
Person responsible for the module	Dr. Miswanto, M.Si.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture and small group discussion
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to prove the concept of integral derivatives in environmental science and technology
Content	Integral derivatives and its application
Examination forms	Written test and assignments
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module

Reading list	<ol style="list-style-type: none"> 1. Purcell E.J., Varberg D.. 1993. Kalkulus dan Geometri Analitik Jilid 1, edisi keempat. Penerbit Erlangga. Jakarta. 2. Purcell E.J., Varberg D.. 1993. Kalkulus dan Geometri Analitik Jilid 2, edisi keempat. Penerbit Erlangga. Jakarta.
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Module designation	Basic of Physics
Semester(s) in which the module is taught	2
Person responsible for the module	Andi Hamim Zaidan, S.Si., M.Si., Ph.D.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students can apply the basic concepts of mechanics, thermodynamics, and waves
Content	Measurement : vector and scalar, kinematics, one-dimensional motion, motion in a plane, dynamics, relative motion, work, energy, linear momentum, rotational dynamics, rigid body dynamics, fluids, fluid statics, hydrostatics, fluid dynamics, thermodynamics, ideal gas, law I thermodynamics, heat capacity, mechanical waves, transverse waves, longitudinal waves, sound waves.
Examination forms	Written test and assignments
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Alonso, M. And Edward J.F. 1982. Physics, 7th ed. Addison-Wesley. Tokyo 2. Giancoli, D.C.. 1998. Fisika, edisi ke-5, terjemahan dalam bahasa Indonesia. Penerbit Erlangga 3. Tipler, P.A.. 1991. Fisika untuk Sains dan Teknik, Jilid 1, edisi ke-3. Penerbit Erlangga

Module designation	Lab Practice for Basic of Physics
Semester(s) in which the module is taught	2

Person responsible for the module	Andi Hamim Zaidan, S.Si., M.Si., Ph.D.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture and practice
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Self-study = 1 hours 10 minutes
Credit points	1.6 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to use basic physics laboratory equipment and properly process and manipulate data in a report
Content	Uncertainty theory, measuring instruments and accuracy. Experiment: mechanics (kinematics and dynamics), statics and fluid dynamics, elasticity, springs, waves, thermodynamics/heat
Examination forms	Written test and report
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 5. Arif Wibowo, R. dkk (Editor). 2005. Pedoman Praktikum Fisika Dasar-1, UPT TPB. Universitas Airlangga 6. Tipler, P.A.. 1991. Fisika untuk Sains dan Teknik, Jilid 1, edisi ke-3, alih bahasa: Lea Prasetyo dan Rahmad W. Adi. Penerbit Airlangga 7. Sears, F.W., and Zemansky, M.W.. College Physics (Mechanics, Heat, and Sound). Addison Wesley Publishing Company, Inc.

Module designation	General Ecology
Semester(s) in which the module is taught	2
Person responsible for the module	Dra. Thin Soedarti, CESA.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS

Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to understand various basic concepts in ecological studies, show the type of interaction between two organisms, and show the relationship between various components in aquatic and terrestrial ecosystems.
Content	Definition of environmental chemistry, pollutant sources, chemical content of water, ground air, chemical reactions in the atmosphere and hydrosphere, waste in the environment, toxicology, indicators of environmental pollution.
Examination forms	Written test and report
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Manahan, SE. 1997. Environmental Chemistry, Willard Grand Press. Boston. 2. Peavy, H.S., Rowe., D.R., and Technobanoglous, G. 1987. Environmental Engineering. Mc Graw Hill Book Company. New York.

Module designation	Lab Practice for General Ecology
Semester(s) in which the module is taught	2
Person responsible for the module	Dra. Thin Soedarti, CESA.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Self-study = 1 hours 10 minutes
Credit points	1.6 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students can understand various basic concepts in ecological studies, show the types of interactions between two organisms, and show the relationships between various components in aquatic and terrestrial ecosystems.
Content	The scope of ecological studies and their role in human life. Principles and concepts about ecosystems, and communities, principles and concepts about populations. Types of interactions in ecology. Principles of limiting factors. Growth/change of components in the ecosystem. Energy flows, matter cycles and ecological pyramids. Environmental carrying capacity. Aquatic, terrestrial and ecotone communities. Allocation of natural natural resources conservation and its ecosystem.

Examination forms	Written test and report
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Molles, M.C., 2005. Ecology: Concepts and Applications, 3rd Ed. Mc Graw Hill. New York. 2. Smith, R.L and Smith, T.M. 2001. Ecology and Field Biology, 6th Ed. Benjamin Cumming. New York.

Module designation	Engineering Drawing
Semester(s) in which the module is taught	2
Person responsible for the module	Dwi Ratri Mitha Isnadina, S.T., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	<p>Lecture = 1 hours 40 minutes</p> <p>Assignment activities = 2 hours</p> <p>Self-study = 2 hours</p>
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to draw drinking water supply and sewerage system buildings, drinking water and wastewater treatment buildings according to the correct technical drawing principles and by using CAD.
Content	Introduction and use of drawing tools, drawing techniques, placement of drawing objects, drawing scale, plans, views and sections of buildings, foundations, roofs and trusses, ceilings, gutters, various types of wood and steel connections, types of drains outcast, with a CAD drawing assignment.
Examination forms	Written test and report
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Soemadi, R. 1985. Konstruksi Bangunan Gedung. Jilid 1 dan 2. Bandung. 2. Seelye, E. E. 1960. Data book for civil engineers, Vol . 1: design. Wiley, New York. 3. Manual Autocad.

Module designation	Lab Practice for Engineering Drawing
Semester(s) in which the module is taught	2
Person responsible for the module	Dwi Ratri Mitha Isnadina, S.T., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Self-study = 1 hours 10 minutes
Credit points	1.6 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to draw drinking water supply and sewerage system buildings, drinking water and wastewater treatment buildings according to the correct technical drawing principles and by using CAD.
Content	Introduction and use of drawing tools, drawing techniques, placement of drawing objects, drawing scale, plans, views and sections of buildings, foundations, roofs and trusses, ceilings, gutters, various types of wood and steel connections, types of drains outcast, with a CAD drawing assignment.
Examination forms	Written test and report
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Soemadi, R. 1985. Konstruksi Bangunan Gedung. Jilid 1 dan 2. Bandung. 2. Seelye, E. E. 1960. Data book for civil engineers, Vol . 1: design. Wiley, New York. 3. Manual Autocad.

Module designation	English I
Semester(s) in which the module is taught	2
Person responsible for the module	Rizal Octofianto Datau, S.S., M.Hum.
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture and discussion

Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to recognize special vocabulary in science and technology discourse which is arranged in a grammatical structure that is commonly used for science and technology writing so that students understand the discourse to assist in reading textbooks in their field and are able to answer questions both orally and in writing.
Content	Special vocabulary in science and technology discourse which is arranged in a grammatical structure that is commonly used for science and technology writing
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Azar, Betty Scramper. 1993. Understanding and Using English Grammar : Edisi Bahasa Inggris – Indonesia. Binarupa Aksar. Jakarta. 2. Alexander, L. G.. 1990. Practice and Progress. Kanisius. Yogyakarta.. Badan Penerbit Undip.

SEMESTER III

Module designation	Environmental Engineering Mathematics
Semester(s) in which the module is taught	3
Person responsible for the module	Dra. Inna Kuswandari, M.Si
Language	Bahasa Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>Calculus</i>

Module objectives/intended learning outcomes	<i>Students can use differential equations</i>
Content	<i>The lecture discusses differential equations</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<i>Engineering Mathematics, Kreyzig</i>

Module designation	Fluid Mechanics
Semester(s) in which the module is taught	3
Person responsible for the module	Dr. Eko Prasetyo Kuncoro, S.T., DEA.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 2 hours 30 minutes Assignment activities = 3 hours Self-study = 3 hours
Credit points	4.8 ECTS
Required and recommended prerequisites for joining the module	<i>Basic Physics</i>
Module objectives/intended learning outcomes	<i>Students can explain and apply the basic principles of fluid flow in the field of environmental engineering.</i>
Content	<i>This lecture discusses fluid mechanics, fluid characteristics, fluid statics, continuity equations, Bernoulli's equations, energy equations, closed channel flow, open channel flow.</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Cengel, Y.A. and Cimbala, J.M. 2006. <i>Fluid Mechanics: Fundamentals and Applications</i>. McGraw-Hill. New York. 2. Finnemore, E.J. and Franzini, J.B. 2002. <i>Fluid Mechanics with Engineering Applications</i>. McGraw-Hill. New York.

Module designation	Structural Knowledge
Semester(s) in which the module is taught	3
Person responsible for the module	Dr. Eko Prasetyo Kuncoro, S.T., DEA.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>Basic Physics</i>
Module objectives/intended learning outcomes	<i>Students can understand various types of structures and their constituent materials, apply statics in environmental engineering and understand the concept of green buildings.</i>
Content	<i>This lecture discusses the types of structures, structural materials, statics, green construction environmental engineering structures and SDGs as well as green buildings.</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Hsieh, Y.Y. 1995. <i>Teori dasar struktur</i>. Erlangga.Jakarta. 2. Hibbeler, R.C. 1998. <i>Mekanika Teknik, Statika 1 dan 2</i>. Prenhalindo. Jakarta. 3. McCormac, J.C. 1981. <i>Structural Steel Design. 3rd. Edition</i>. Harper and Row. New York

Module designation	Environmental Chemistry
Semester(s) in which the module is taught	3
Person responsible for the module	GANDEN SUPRIYANTO
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>

Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>No required source</i>
Module objectives/intended learning outcomes	<i>Students can describe chemical concepts related to the environment</i>
Content	<i>This lecture discusses definition of environmental chemistry, pollutant sources, chemical content of water, ground air, chemical reactions in the atmosphere and hydrosphere, waste in the environment, toxicology, indicators of environmental pollution</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<p>1. Manahan, SE. 1997. <i>Environmental chemistry</i>, Willard Grand Press. Boston.</p> <p>2. Peavy, H.S., Rowe., D.R., and Technobanoglous, G. 1987. <i>Environmental Engineering</i>. Mc Graw Hill Book Company. New York.</p>

Module designation	Environmental Chemistry Lab
Semester(s) in which the module is taught	3
Person responsible for the module	GANDEN SUPRIYANTO
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 70 minutes
Credit points	1.6 ECTS
Required and recommended prerequisites for joining the module	<i>No required source</i>
Module objectives/intended learning outcomes	<i>Students can describe chemical concepts related to the environment</i>

Content	<i>This practicum studies definition of environmental chemistry, pollutant sources, chemical content of water, ground air, chemical reactions in the atmosphere and hydrosphere, waste in the environment, toxicology, indicators of environmental pollution</i>
Examination forms	<i>Written test and practicum report</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<p>1. Manahan, SE. 1997. <i>Environmental chemistry</i>, Willard Grand Press. Boston.</p> <p>2. Peavy, H.S., Rowe., D.R., and Technobanoglous, G. 1987. <i>Environmental Engineering</i>. Mc Graw Hill Book Company. New York.</p>

Module designation	Environmental Microbiology
Semester(s) in which the module is taught	3
Person responsible for the module	Drs. Agus Supriyanto, M. Kes
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>No required source</i>
Module objectives/intended learning outcomes	<i>Students are able to plan research in the field of microbiology, explain the basic principles of microbiology to other biologists, develop an interest in the field of microbiology, and explain the basic concepts of microbiology correctly.</i>
Content	<i>This lecturer discusses history and benefits of microbiology, general overview of microbes, media and microbial growth, sterilization and disinfection, microbial metabolism and microbial genetics, morphology and anatomical structure of bacterial cells; fungi and viruses.</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module

Reading list	<p>1. Adams, R.M. 1990. <i>Mikrobiology fundamental and application</i>. McMilan Publishing Company. N.Y.</p> <p>2. Pelzar, M.J., dan Chan, E.C.S. 1981. <i>Element of microbiology</i>. McGraw Hill International Book Co.</p> <p>3. Schlegel, H.G., dan Schmidt, K. 1964. <i>Mikrobiologi Umum</i>. Gajah Mada University Press.</p>
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Module designation	Environmental Microbiology Lab
Semester(s) in which the module is taught	3
Person responsible for the module	Drs. Agus Supriyanto, M. Kes
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lab works and discussion</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 70 minutes
Credit points	1.6 ECTS
Required and recommended prerequisites for joining the module	<i>No required source</i>
Module objectives/intended learning outcomes	<i>Students are able to carry out scientific research using the provisions from microbiology practicum, explain the basic principles applied in microbiology practicum, work in groups in carrying out and completing assignments in microbiology practicum, and work on and practice laboratory preparation, cultivation methods and quantification as well as identification and characterization of microbes with Correct.</i>
Content	<i>This practicum studies sterilization techniques, media and how to make media, techniques for aseptically transferring microbial cultures, isolating microbes from a mixture, microbial characteristics, staining techniques, determining the number and size of microbes microscopically, microbial growth curves, environmental influences on microbial growth, testing microbial physiology, fermentation, microbial identification.</i>
Examination forms	<i>Written test and practicum report</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module

Reading list	<p>1. Cappucino, J.G. and Sherman, N. 1883. <i>Microbiology in Laboratory Manual</i>. Addison-Wesley Publishing Company.</p> <p>2. Hadioetomo Ratna Siri, 1993. <i>Mikrobiologi Dasar dalam Praktek</i>. P.T. Gramedia Pustaka Umum. Jakarta.</p> <p>3. Schlegel, H.G., dan Schmidt, K. 1964. <i>Mikrobiologi Umum</i>. Gajah Mada University Press.</p>
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Module designation	Environmental Analysis Methods and Techniques
Semester(s) in which the module is taught	3
Person responsible for the module	Dr. Eko Prasetyo, K., S. T., DEA.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>No required source</i>
Module objectives/intended learning outcomes	<i>Students are able to explain and apply engineering and analytical methods for environmental purposes.</i>
Content	<i>This lecturer discusses methods, techniques and analysis of terrestrial flora and fauna, aquatic biota, chemical aspects of groundwater and air, environmental health</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<p>1. Krebs, C.J. 1978. <i>Ecology: The Experimental Analysis of Distribution and Abundance</i>. Second edition. Harper & Row. New York.</p> <p>2. Manahan, SE.. 1997. <i>Environmental chemistry</i>. Willard Grand Press. Boston.</p> <p>3. Slamet, JS. 2000. <i>Kesehatan Lingkungan</i>. Gadjah Mada University Press. Yogyakarta.</p> <p>4. Begon, M. Dan M. Mortimer. 1980. <i>Population Ecology : A Unified Study of Aninals and Plants</i>. Black Well Scientific Publications. London</p>

Module designation	Environmental Analysis Methods and Techniques
Semester(s) in which the module is taught	3
Person responsible for the module	Nita Citrasari, S.Si., M.T.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lab works</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 70 minutes
Credit points	1.6 ECTS
Required and recommended prerequisites for joining the module	<i>No required source</i>
Module objectives/intended learning outcomes	<i>Students are able to carry out environmental sampling and analysis which are represented by physical, chemical and biological parameters of the water and air environment, after attending lectures students are able to explain and apply engineering and analytical methods for environmental needs.</i>
Content	<i>Practical sampling of water, air, biota; analysis of physical, chemical and biological parameters of the water environment (temperature, turbidity, TSS, pH, DO, BOD, plankton and macrobenthos); noise analysis, methods, techniques and analysis of terrestrial flora and fauna, aquatic biota, chemical aspects of groundwater and air, environmental health</i>
Examination forms	<i>Written test and practicum report</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. <i>Petunjuk Praktikum Metode Teknik Analisis Lingkungan</i> 2. <i>Krebs, C.J. 1978. Ecology: The Experimental Analysis of Distribution and Abundance. Second edition. Harper & Row. New York.</i> 3. <i>Manahan, SE. 1997. Environmental chemistry. Willard Grand Press. Boston.</i> 4. <i>Slamet, JS. 2000. Kesehatan Lingkungan. Gadjah Mada University Press. Yogyakarta.</i> 5. <i>Begon, M. Dan M. Mortimer. 1980. Population Ecology: A Unified Study of Animals and Plants. Black Well Scientific Publications. London</i>

Module designation	Natural resource management
Semester(s) in which the module is taught	3
Person responsible for the module	Drs. Trisnadi W. C. P., M. Si.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>No required source</i>
Module objectives/intended learning outcomes	<i>Students are able to explain the basics of managing natural resources and the (living) environment according to ecological principles and applying ecological principles in the management of specific natural resources and environment.</i>
Content	<i>This lecturer discusses fundamentals of management of natural resources and the (living) environment according to ecological principles and an ecosystem approach, methodologies in resource inventory and planning, integrated surveys, systems analysis, examples of application and general overview, examples of management of natural resources and specific environments (eg natural resources forests, mineral resources etc.).</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Burgman M.A., A. Ferson and H.R. Ak~akaya. 1993. <i>Risk Assessment for Conservation Biology</i>. Champan and Hall. London. 2. Bryant, P. 2003. <i>Biodiversity and conservation: a Hypertext</i>. Book. 3. Caughley G.&A. Gunn., 1995. <i>Conservation Biology in Theory and Practice</i>. Blackwell Science. Cambridge. 4. Primarck R.B. 1993. <i>Essentials of Conservation Biology</i>. Sinnaeur Associates Inc. Sunderland. 5. Asdak, Chay.1995. <i>Hidrologi dan Pengelolaan Dearah Aliran Sungai</i>. Gadjah Mada University Press. Yogyakarta

Module designation	Environmental Remote Sensing
Semester(s) in which the module is taught	3
Person responsible for the module	Dra. Thin Soedarti, CESA
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>General Ecology</i>
Module objectives/intended learning outcomes	<i>Students can process remote sensing image data and apply it in the field of environmental engineering</i>
Content	<i>This lecture discusses the processing and utilization of extra-terrestrial recorded spatial data.</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Morton J. Canty. 2014. <i>Image Analysis, Classification and Change Detection in Remote Sensing</i>. 2. W. G. Rees. 2013. <i>Physical Principles of Remote Sensing</i> 3. Paul Mather, Brandt Tso. 2009. <i>Classification Methods for Remotely Sensed Data, Second Edition</i>. 4. Ralph W. Kiefer, Thomas Lillesand. 1979. <i>Remote Sensing and Image Interpretation</i>.

Module designation	Watershed Management
Semester(s) in which the module is taught	3
Person responsible for the module	Drs. Trisnadi Widyleksono C.P., M.Si.
Language	Indonesia

Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>General Ecology</i>
Module objectives/intended learning outcomes	<i>Students can understand the principles of watershed management, problem analysis and preparation of integrated watershed management plans.</i>
Content	<i>This lecture discusses the types of watershed problems and how to identify them, examples of programs implemented for watershed management, environmental resource analysis, basic watershed management, integration of watershed management, and evaluation and monitoring of programs implemented in watersheds.</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<p><i>1. Asdak, C., 1995. Hidrologi dan Pengelolaan Daerah Aliran Sungai. Gadjah Mada University Press. Yogyakarta.</i></p> <p><i>2. Suyono., 2001. Pengelolaan Daerah Aliran Sungai Terpadu dalam Rangka Pengendalian Tata Air Berwawasan Lingkungan. Seminar Eco-Hydraulic. Fakultas Teknik Jurusan Teknik Sipil UGM. Yogyakarta.</i></p>

Module designation	Integrated Management of Coastal and Marine Areas
Semester(s) in which the module is taught	3
Person responsible for the module	Drs. Trisnadi Widyaleksono C.P., M.Si.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours

Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>General Ecology</i>
Module objectives/intended learning outcomes	<i>Students can explain the management of related areas</i>
Content	<i>This lecture discusses determination of coastal area boundaries, basic principles of integrated management of coastal and marine areas, spatial planning of coastal cities, potential hazards of coastal and marine areas, adaptation to climate change in coastal areas, management of coastal and marine areas of neighboring countries and institutions</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	

Module designation	Marine Pollution and Its Control
Semester(s) in which the module is taught	3
Person responsible for the module	Prof. Dr. Ir. Agoes Soegianto, DEA.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>General Ecology</i>
Module objectives/intended learning outcomes	<i>Students can explain marine pollution control</i>
Content	<i>This lecture discusses pollution and control of seawater pollution</i>
Examination forms	<i>Written test, oral presentation and essay</i>

Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	

SEMESTER IV

Module designation	Environmental Engineering Math II
Semester(s) in which the module is taught	4
Person responsible for the module	Dio Alif Hutama, S.T., M.Sc.
Language	Indonesian
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	Environmental Engineering Math I
Module objectives/intended learning outcomes	Students are able to apply mathematics in solving problems in the field of environmental engineering
Content	This course discusses differential equations, integrals, laplace transformations
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Kreyzig, Edwin. 1993. Matematika Teknik Lanjutan 1, Alih Bahasa Bambang Sumantri. Gramedia Pustaka Utama. Jakarta.

Module designation	Soil Mechanics and Hydrogeology
Semester(s) in which the module is taught	4
Person responsible for the module	Dr. Eko Prasetyo Kuncoro, S.T., DEA.
Language	Indonesian
Relation to curriculum	Compulsory
Teaching methods	Lecture

Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	Basic of Physics
Module objectives/intended learning outcomes	Students are able to apply the principles of soil mechanics and hydrogeology to support simple building planning in the field of environmental engineering.
Content	This course discusses soil origin, soil property index, soil classification, soil stress, soil shear strength, soil lateral pressure, seepage, hydrological cycle, aquifer system, groundwater quality, groundwater pollution and groundwater management.
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Braja M. Das. 2010. Principles of Geotechnical Engineering. Cengage Learning. Stamford. 2. Adriano D.C. 1999. Contamination of groundwaters. St Lucie Boca Raton. 3. Kodoati, Robert J. 1996. Pengantar Hidrogeologi. Andi. Yogyakarta.

Module designation	Environmental Engineering Operations Unit
Semester(s) in which the module is taught	4
Person responsible for the module	Dr. Eko Prasetyo Kuncoro, S.T., DEA.
Language	Indonesian
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 2 hours 30 minutes Assignment activities = 3 hours Self-study = 3 hours
Credit points	4.8 ECTS
Required and recommended prerequisites for joining the module	Fluid Mechanics
Module objectives/intended learning outcomes	Students are able to explain calculations in operating units in design/operations in environmental engineering.

Content	This course discusses types of filtration, settling, stirring, aeration, membrane separation, electro dialysis, dewatering, drying, grinding, sizing, waste and their functions; schematics and equipment performance; applicable equations; calculation examples
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Rich, L., 1963. Unit Operation of Sanitary Engineering, John Willey & Sons. 2. Reynolds, T., 1982. Unit Operation and Process in Environmental Engineering, PWS. Publisher. 3. Benefield & Rendal, C., 1980. Biological Process Design for Waste Water Treatment. Prentice Hall.

Module designation	Lab Practice for Environmental Engineering Operations Unit
Semester(s) in which the module is taught	4
Person responsible for the module	Dr. Eko Prasetyo Kuncoro, S.T., DEA.
Language	Indonesian
Relation to curriculum	Compulsory
Teaching methods	Lecture and practice
Workload (incl. contact hours, self-study hours)	Lecture = 100 minutes Self-study = 70 minutes
Credit points	1.6 ECTS
Required and recommended prerequisites for joining the module	Fluid Mechanics
Module objectives/intended learning outcomes	Students are able to explain calculations in operating units in design/operations in environmental engineering.
Content	This course discusses types of filtration, settling, stirring, aeration, membrane separation, electro dialysis, dewatering, drying, grinding, sizing, waste and their functions; schematics and equipment performance; applicable equations; calculation examples
Examination forms	Written test and report
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Rich, L., 1963. Unit Operation of Sanitary Engineering, John Willey & Sons. 2. Reynolds, T., 1982. Unit Operation and Process in Environmental Engineering, PWS. Publisher. 3. Benefield & Rendal, C., 1980. Biological Process Design for Waste Water Treatment. Prentice Hall.

Module designation	Environmental Engineering Process Unit
Semester(s) in which the module is taught	4
Person responsible for the module	Dr. Eko Prasetyo Kuncoro, S.T., DEA.
Language	Indonesian
Relation to curriculum	Compulsory
Teaching methods	Lecture and discussion
Workload (incl. contact hours, self-study hours)	Lecture = 2 hours 30 minutes Assignment activities = 3 hours Self-study = 3 hours
Credit points	4.8 ECTS
Required and recommended prerequisites for joining the module	Fluid Mechanics, Basic of Biology, Environmental Chemistry
Module objectives/intended learning outcomes	Students are able to plan the process and technology of wastewater treatment and its supporting buildings properly.
Content	This course discusses definitions and overview, effluent water quality, water quality requirements, effluent water quantity, unit of operation and process, unit physics: grit chamber: bar screen; equalization; sedimentation, chemical unit: neutralization; coagulation; flocculation; disinfection, activated sludge; trickling filter, oxidation ponds
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Met Calf, Eddy. Waste Water Engineering, Collection and Pumping. John Willey & Sons. New-York. 2. Babbit, 1972. Sewerage and Sewage Treatment. John Willey & Sons. New York. 3. Syed R. Qosim. Waste Water Design and Plant NSPM tentang air buangan.

Module designation	Lab Practice for Environmental Engineering Process Unit
Semester(s) in which the module is taught	4
Person responsible for the module	Dr. Eko Prasetyo Kuncoro, S.T., DEA.
Language	Indonesian
Relation to curriculum	Compulsory
Teaching methods	Lecture and practice
Workload (incl. contact hours, self-study hours)	Lecture = 100 minutes Self-study = 70 minutes

Credit points	1.6 ECTS
Required and recommended prerequisites for joining the module	Fluid Mechanics, Basic of Biology, Environmental Chemistry
Module objectives/intended learning outcomes	Students are able to plan the process and technology of wastewater treatment and its supporting buildings properly.
Content	This course discusses definitions and overview, effluent water quality, water quality requirements, effluent water quantity, unit of operation and process, unit physics: grit chamber: bar screen; equalization; sedimentation, chemical unit: neutralization; coagulation; flocculation; disinfection, activated sludge; trickling filter, oxidation ponds
Examination forms	Written test and report
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Met Calf, Eddy. Waste Water Engineering, Collection and Pumping. John Willey & Sons. New-York. 2. Babbit, 1972. Sewerage and Sewage Treatment. John Willey & Sons. New York. 3. Syed R. Qosim. Waste Water Design and Plant NSPM tentang air buangan.

Module designation	Ecotoxicology
Semester(s) in which the module is taught	4
Person responsible for the module	Prof. Dr. Agoes S., DEA
Language	Indonesian
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	General Ecology, Environmental Chemistry
Module objectives/intended learning outcomes	Students are able to understanding of ecotoxicology, the behaviour of pollution materials and their impact on biological systems.
Content	This course discusses limitations and definition of ecotoxicology, environmental contaminants, bioaccumulation and influencing factors, toxicant effects, risk of contaminants.
Examination forms	Written test and assignment

Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Newman, M.C., Unger, J.M.A. 2003. Fundamentals of ecotoxicology, Second edition. Lewis Publishers. Boca Raton. 2. Ramade, F. 1987. Ecotoxicology. John Wiley and Sons. New York

Module designation	Environmental Statistics
Semester(s) in which the module is taught	4
Person responsible for the module	
Language	Indonesian
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to apply statistics to the environmental field
Content	This course discusses the basics of statistics and its application.
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	

Module designation	Management of Company and Organization
Semester(s) in which the module is taught	4
Person responsible for the module	
Language	Indonesian
Relation to curriculum	Compulsory
Teaching methods	Lecture, discussion, assignment, guest lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours

Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to make a business plan and organize a project/activity as an implementation of all material in company and organization management.
Content	This course discusses explanation of the basis of management and SWOT analysis, organization with the environment and its interaction, effective planning, organizational structure and division of tasks, control, job satisfaction and motivation, leadership, and human resource development as well as how to prepare business plans and project proposals.
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	

Module designation	Environmental Geographic Information System
Semester(s) in which the module is taught	4
Person responsible for the module	Dra. Thin Soedarti, CESA
Language	Indonesian
Relation to curriculum	Elective
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	General Ecology
Module objectives/intended learning outcomes	Students are able to use computer-based systems to manage geographic data and apply them in the field of environmental engineering
Content	This course discusses the definition of GIS, GIS components, data format, spatial referencing, data conversion, data structure, spatial database and attribute database
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module

Reading list	<ol style="list-style-type: none"> 1. Burrough P.A. 1998. Principle of GIS for Land Resources Assessment. Oxford. 2. Christopher Jones. 1999. GIS and Computer Cartography. Longman England. 3. Green D. and T. Bossomaier. 2002. Online GIS and spatial metadata. Taylor & Francis. 4. Aronoff S. 1989. Geographic information systems: a management perspective. WDL Publications. 5. Kang-Tsung Chang. 2008. Introduction to Geogpahic Information Systems, Fourth Edition. Mc Graw Hill. Singapore.
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Module designation	Biomonitoring
Semester(s) in which the module is taught	4
Person responsible for the module	
Language	Indonesian
Relation to curriculum	Elective
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to can explain environmental quality monitoring
Content	This course discusses environmental quality monitoring
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	

Module designation	Plumbing and Pump
Semester(s) in which the module is taught	4
Person responsible for the module	Dwi Ratri Mitha Isnadina, S.T., M.T.
Language	Indonesian
Relation to curriculum	Elective
Teaching methods	Lecture

Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	Fluid Mechanics
Module objectives/intended learning outcomes	After completing this course, you will be able to select and determine the instrumentation system and equipment installation to design clean water and dirty water equipment installations in an area as needed.
Content	This course discusses introduction, installation equipment: blowers, pumps, aerators, compressors, instrumentation: pH control, flow rate control, pressure control, level control, valves.
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Harold E. Babbit, 1960. Plumbing. Mc.Graw-Hill Book Company. New York. 2. Sofyan M. Noerbambang, Takeo Morimura, 1986. Perancangan dan Pemeliharaan Sistem Plambing. PT Pradnya Paramita. Jakarta. 3. Babbit, 1972. Sewerage and Sewage Treatment. John Willey & Sons. New York.

Module designation	New and Renewable Energy
Semester(s) in which the module is taught	4
Person responsible for the module	Dr. Eko Prasetyo Kuncoro, S.T., DEA.
Language	Indonesian
Relation to curriculum	Elective
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to explain new renewable energy
Content	This course explains about renewable energy, its types, and potential in Indonesia.

Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	

SEMESTER V

Module designation	Water Supply System
Semester(s) in which the module is taught	5
Person responsible for the module	Dr. Nurina Fitriani, S.T.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	Operation Unit
Module objectives/intended learning outcomes	Students are able to plan the construction of drinking water treatment plants, operation and maintenance systems, cost estimates and expansion plans of drinking water treatment plants correctly.
Content	Calculation of phasing requirements and planning periods, calculation of raw water requirements, calculation of treatment discharge (complete and incomplete), flow diagram, treatment building layout, calculation of treatment building dimensions, hydraulic profile, equipment, cost, operation, and maintenance.
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Kawamura, Susumu. 2000. Integrated design and operation of water treatment facilities. 2nd Ed. John Wiley. New York 2. ASCE. 1990. Water treatment plant design. 2ed. McGraw-Hill New York.

Module designation	Lab Practice for Water Supply System
Semester(s) in which the module is taught	5

Person responsible for the module	Dr. Nurina Fitriani, S.T.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture and practice
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Self-study = 1 hours 10 minutes
Credit points	1.6 ECTS
Required and recommended prerequisites for joining the module	Operation Unit
Module objectives/intended learning outcomes	Students are able to plan the construction of drinking water treatment plants, operation and maintenance systems, cost estimates and expansion plans for drinking water treatment plants correctly.
Content	Calculation of phasing requirements and planning periods, calculation of raw water requirements, calculation of treatment discharge (complete and incomplete), flow diagram, treatment building layout, calculation of treatment building dimensions, hydraulic profile, equipment, cost, operation, and maintenance.
Examination forms	Written test and report
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Kawamura, Susumu. 2000. Integrated design and operation of water treatment facilities. 2nd Ed. John Wiley. New York 2. ASCE. 1990. Water treatment plant design. 2ed. McGraw-Hill New York.

Module designation	Wastewater Distribution System
Semester(s) in which the module is taught	5
Person responsible for the module	Dwi Ratri Mitha Isnadina, S.T., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS

Required and recommended prerequisites for joining the module	Operation Unit and Soil Mechanics and Hydrogeology
Module objectives/intended learning outcomes	Students are able to understand the purpose and objectives of waste water distribution system planning, population projections and calculation of waste water quantity, alternative waste water distribution systems and their applications, system planning consisting of: determination of service areas, system selection, dimensions and hydraulic calculations, complementary buildings and their maintenance.
Content	The purpose and objectives of wastewater distribution system planning, population projection and calculation of wastewater quantity, alternative wastewater distribution systems and their applications, system planning consisting of: determination of service areas, system selection, dimensions and hydraulic calculations, complementary buildings and their maintenance.
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Bedient, Philip B & wayne C Huber.1992. Hydrology and floodplain analysis. 2nd ed. Addison Wesley. New York. 2. Anonymus. 1989. Road surface drainage planning procedure. National standardization board. Jakarta.

Module designation	Lab Practice of Wastewater Distribution System
Semester(s) in which the module is taught	5
Person responsible for the module	Dwi Ratri Mitha Isnadina, S.T., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture and practice
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Self-study = 1 hours 10 minutes
Credit points	1.6 ECTS
Required and recommended prerequisites for joining the module	Operation Unit and Soil Mechanics and Hydrogeology
Module objectives/intended learning outcomes	Students are able to understand the purpose and objectives of waste water distribution system planning, population projections and calculation of waste water quantity, alternative waste water distribution systems and their applications, system planning consisting of: determination of service areas, system selection, dimensions and hydraulic calculations, complementary buildings and their maintenance.

Content	The purpose and objectives of wastewater distribution system planning, population projection and calculation of wastewater quantity, alternative wastewater distribution systems and their applications, system planning consisting of: determination of service areas, system selection, dimensions and hydraulic calculations, complementary buildings and their maintenance.
Examination forms	Written test and report
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Bedient, Philip B & wayne C Huber.1992. Hydrology and floodplain analysis. 2nd ed. Addison Wesley. New York. 2. Anonymus. 1989. Road surface drainage planning procedure. National standardization board. Jakarta.

Module designation	Solid Waste Management
Semester(s) in which the module is taught	5
Person responsible for the module	Nita Citra Sari, S.Si., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	Operation Unit and Process Unit
Module objectives/intended learning outcomes	- Students will be able to explain the composition and characteristics of solid waste. - Can plan solid waste processing and utilization technology.
Content	Definition of waste, composition and characterization, planning of processing and utilization technology (composting, incineration, recycling) of waste, waste disposal methods, prospects for economic value
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Mukai, Akira., 1999. Sanitary Landfill system. Jica.jakarta. 2. Vesilind, P.Aarn. William Worrel and Debra Reinhard. 2002. Solid waste engineering. Brooks/Cole,Pacivic Grove.

Module designation	Lab Practice of Solid Waste Management
Semester(s) in which the module is taught	5
Person responsible for the module	Nita Citra Sari, S.Si., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture and practice
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Self-study = 1 hours 10 minutes
Credit points	1.6 ECTS
Required and recommended prerequisites for joining the module	Operation Unit and Process Unit
Module objectives/intended learning outcomes	- Students will be able to explain the composition and characteristics of solid waste. - Can plan solid waste processing and utilization technology.
Content	Definition of waste, composition and characterization, planning of processing and utilization technology (composting, incineration, recycling) of waste, waste disposal methods, prospects for economic value
Examination forms	Written test and report
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Mukai, Akira., 1999. Sanitary Landfill system. Jica.jakarta. 2. Vesilind, P.Aarn. William Worrel and Debra Reinhard. 2002. Solid waste engineering. Brooks/Cole,Pacivic Grove.

Module designation	Air Pollution Prevention and Control
Semester(s) in which the module is taught	5
Person responsible for the module	Dr. Eko Prasetyo K., S. T., DEA.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	lecture
Workload (incl. contact hours, self-study hours)	Lecture = 2 hours 30 minutes Assignment activities = 3 hours Self-study = 3 hours
Credit points	4.8 ECTS

Required and recommended prerequisites for joining the module	Operation Unit and Process Unit
Module objectives/intended learning outcomes	Students can correctly plan gas processing processes and technologies and supporting buildings.
Content	History of air pollution, sources and types of air and noise pollutants and their impact on the environment, health, air quality standards, factors affecting the spread of air contaminants, air quality monitoring systems, air quality dispersion models, air quality management systems. Design stages and procedures, particulate motion and particle behavior in fluids, gas contaminant control technologies, emissions, and mobile sources.
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Boedisantoso, Rachmat. 2002. Air pollution control technology. Textbook.DUE-like Project ITS, Surabaya 2. Theodore, Louis & Anthony Buonicore (ed). 1994. Air pollution control equipment-selection, design, operation and maintenance. Springer Verlag, Berlin.

Module designation	Introduction to Environmental Documents
Semester(s) in which the module is taught	5
Person responsible for the module	Drs. Trisnadi Widyalaksono C. P., M.Si.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	<p>Lecture = 1 hours 40 minutes</p> <p>Assignment activities = 2 hours</p> <p>Self-study = 2 hours</p>
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	Environmental Analysis Technique Method
Module objectives/intended learning outcomes	Students are able to prepare environmental documents
Content	The course discusses various environmental documents
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	-

Module designation	Research Methods
Semester(s) in which the module is taught	5
Person responsible for the module	Prof. Dr. Ir. Agoes Soegianto, DEA.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Students can design research, make research proposals and scientific reports correctly.
Content	Scientific methods in research, Types and methods of research, Research process, test design, Sampling, Statistical analysis, Scientific writing procedures.
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Nazir, M. 1985. Research Methods. Galia Indonesia. Jakarta. 2. Dane, Francis C. 1990. Research Methods. Mercer University. California. 3. Steel, R.G.D., Torrie J.H. 1981. Principles and Procedures of Statistics, A Biometric Approach. Mc Graw Hill. Tokyo.

Module designation	Water Resources Management and Quality
Semester(s) in which the module is taught	5
Person responsible for the module	Dr. Nurina Fitriani, S.T.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS

Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Students are able to explain water quality management
Content	The course discusses water quality, modeling
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	-

Module designation	City Territory and Spatial Planning
Semester(s) in which the module is taught	5
Person responsible for the module	Dr. Nurina Fitriani, S.T.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Students are able to explain city planning
Content	The course discusses regulations, city governance
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	-

Module designation	Environmental Bioremediation and Phytotechnology
Semester(s) in which the module is taught	5
Person responsible for the module	M. Fauzul Imron, S.T., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory

Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	Environmental Microbiology
Module objectives/intended learning outcomes	Students can apply the concepts of environmental and plant microbiology in the environmental field
Content	The course discusses microorganisms, plants and their application in the environmental field.
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Sarwoko. 2005. Fitoteknologi dan Ekotoksikologi dalam Desain Operasi Pengomposan Sampah. Seminar Nasional Teknologi Lingkungan III ITS Surabaya, 27 September 2005.

Module designation	Environmental Geotechnics
Semester(s) in which the module is taught	5
Person responsible for the module	Dio Alif Hutama, S.T., M.Sc.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	Soil Mechanics and Hydrogeology
Module objectives/intended learning outcomes	Students are able to apply geotechnical principles in various plans in the field of environmental engineering
Content	This course discusses soil investigation, bearing capacity, soil settlement, soil compaction, slope stability, geosynthetics, soil improvement.
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module

Reading list	<ol style="list-style-type: none"> 1. Braja M. Das and Khaled Sobhan. 2014. Principles of Geotechnical Engineering, Eight Edition SI. Cengage Learning. Stamford. 2. Braja M. Das. 2008. Advanced Soil Mechanics Third Edition. Taylor & Francis. New York. 3. Braja M. Das. 2011. Principles of Foundation Engineering, SI, Seventh Edition. Cengage Learning. Stamford. 4. Robert M. Koerner. 2005. Designing with Geosynthetics, Fifth Edition. Pearson Prentice Hall. New Jersey.
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Module designation	Energy Conversion and Efficiency Engineering
Semester(s) in which the module is taught	5
Person responsible for the module	Dr. Eko Prasetyo K., S. T., DEA.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Students are able to explain energy conversion and efficiency
Content	The course discusses energy conversion, energy efficiency
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Culp, Archie WJ, Sitompul, Darwin, 1991. Principles of Energy Conversion. Erlangga. Jakarta.

SEMESTER VI

Module designation	Drinking Water Treatment Building Planning
Semester(s) in which the module is taught	6
Person responsible for the module	Dr. Nurina Fitriani, S.T.

Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 2 hours 30 minutes Assignment activities = 3 hours Self-study = 3 hours
Credit points	4.8 ECTS
Required and recommended prerequisites for joining the module	<i>Operation Unit and Process Unit</i>
Module objectives/intended learning outcomes	<i>Students understand the problems related to the needs, distribution, supply of drinking water.</i>
Content	<i>This lecture discusses projection of water demand, raw water sources, intake, transmission pipelines, pressure relief tank buildings, water valves, washouts, pipe bridges, distribution system planning principles consisting of service areas, pipelines and equipment, water supply system equipment drink, reservoir, formation of one control.</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Thomas M. Walski, Donald V. Chase & Dragan A. Savic. 2001. <i>Water Distribution Modelling-Haested methods. Haested Waterbury.</i> 2. Clark, J.W. 1993. <i>Water Supply and pollution sontrol 5ed. Harper & Row, New York</i>

Module designation	Drinking Water Processing Building Design Practicum
Semester(s) in which the module is taught	6
Person responsible for the module	Dr. Nurina Fitriani, S.T.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lab works</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 70 minutes
Credit points	1.6 ECTS

Required and recommended prerequisites for joining the module	<i>Operation Unit and Process Unit</i>
Module objectives/intended learning outcomes	<i>Students understand the problems related to the needs, distribution, supply of drinking water.</i>
Content	<i>This lecture discusses projection of water demand, raw water sources, intake, transmission pipelines, pressure relief tank buildings, water valves, washouts, pipe bridges, distribution system planning principles consisting of service areas, pipelines and equipment, water supply system equipment drink, reservoir, formation of one control.</i>
Examination forms	<i>Project</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Thomas M. Walski, Donald V. Chase & Dragan A. Savic. 2001. <i>Water Distribution Modelling-Haested methods. Haested Waterbury.</i> 2. Clark, J.W. 1993. <i>Water Supply and pollution sontrol 5ed. Harper & Row, New York</i>

Module designation	Hazardous Waste Management
Semester(s) in which the module is taught	6
Person responsible for the module	Dr. Eko Prasetyo Kuncoro, S.T., DEA.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 2 hours 30 minutes Assignment activities = 3 hours Self-study = 3 hours
Credit points	4.8 ECTS
Required and recommended prerequisites for joining the module	<i>Operation Unit and Process Unit</i>
Module objectives/intended learning outcomes	<i>Students are able to explain the concepts and applications of B3 waste management correctly according to procedures.</i>
Content	<i>This lecture discusses B3 waste definition, B3 waste legislation, waste characteristics, B3 waste sources, B3 waste transport and fate, B3 waste pollution prevention and B3 waste audit, physical, chemical and biological treatment of B3 waste (water stripping, adsorption, incineration, solidification, landfill, bioremediation), B3 waste container and storage, hospital waste management.</i>
Examination forms	<i>Written test, oral presentation and essay</i>

Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<i>Hazardous Waste Management, LaGrega</i> <i>Hazardous Waste, Watts</i> <i>Hazardous Management, Wentz</i>

Module designation	Project Management
Semester(s) in which the module is taught	6
Person responsible for the module	Nur Indradewo O., S.T., M.T.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<i>Students have an understanding of the basic principles of project management.</i>
Content	<i>This lecture discusses project development process, basic principles of management, leadership and feasibility studies, tender documents, tenders, contracts and project price estimates, tender procedures and processes, project implementation in the field, procurement, planning cycle, project scheduling and control, resource allocation and control project</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<i>1. Suharto, Iman. 2002. Manajemen Proyek I dan II (dari konseptual sampai operasional. Edisi kedua. Erlangga, Jakarta.</i> <i>2. Ali, Tubagus Haedar. 1995. Prinsip-Prinsip Network Planning. Gramedia, Pustaka utama. Jakarta.</i>

Module designation	Occupational Health and Safety
Semester(s) in which the module is taught	6

Person responsible for the module	Febri Eko Wahyudianto, S.T., M.T.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>Introduction to Environmental Science and Technology</i>
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> 1. Student can identify hazards in a process. 2. Student can explain issues related to occupational safety and health, 3. Student can provide alternative solutions to problems related to occupational safety and health. 4. Student can explain regulations related to occupational safety and health.
Content	<i>This lecture discusses Basics of Occupational Health and Safety (K3), Law No. 1 of 1970, Occupational Health, Work Environment, B3 Control, K3 Institutional, Fire Fighting, Construction K3, Work Accident Analysis and Reporting, Risk Management, SMK3 and SMK3 Audit.</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Cole, R. A., 1975. <i>Industrial Safety Techniques</i>. West Publishing Corporation. Sydney 2. Hammer, W. 1980. <i>Product Safety Management and Engineering</i>. Engelwood Cliffs. 3. <i>Himpunan Peraturan Perundang-undangan Keselamatan dan Kesehatan Kerja</i>

Module designation	Environmental Law
Semester(s) in which the module is taught	6
Person responsible for the module	
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>

Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<i>Students can explain the legal aspects of environmental management, environmental law enforcement and analysis of environmental cases in a juridical manner.</i>
Content	<i>This lecture presents a discussion of the legal aspects of environmental management, environmental law enforcement and analysis of environmental cases in a juridical manner.</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Hardjosoemantri, K. 1994. <i>Hukum Tata Lingkungan. Cetakan ke II. Gajah Mada University Press. Yogyakarta</i> 2. Rangkuti, SS. 1991. <i>Inovasi Hukum Lingkungan : dari Lus constitutum. Pidato Pengukuhan. Airlangga. Surabaya</i> 3. Rangkuti, SS. 1995.. <i>Sarana Hukum Pengendalian Pencemaran udara. Pidato Ilmiah Dies Natalis XLI. Universitas Airlangga, Surabaya.</i>

Module designation	Technopreneurship
Semester(s) in which the module is taught	6
Person responsible for the module	Febri Eko Wahyudianto, S.T., M.T.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<i>Students can be entrepreneurs</i>

Content	<i>This lecture discusses technology-based entrepreneurship</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	

Module designation	Religion 2
Semester(s) in which the module is taught	6
Person responsible for the module	MKWU Team
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>Religion 1</i>
Module objectives/intended learning outcomes	<i>Students can understand various ways to strengthen faith and piety and develop noble character and make Islamic teachings the basis for thinking and behaving in professional development</i>
Content	<i>This course discusses:</i> <i>a) The concept of God in Islam, faith and piety, the implementation of faith and piety in modern life,</i> <i>b) Human nature according to Islam, understanding of law, human rights and democracy in Islam, Islamic law and the contribution of Indonesian Muslims,</i> <i>c) Ethics, morals and morals, science and technology and art in Islam,</i> <i>d) Inter-religious harmony, civil society and people's welfare, Islamic economics, Islamic culture, and Islamic political system</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module

Reading list	<p>1. Abdushshomad, Muhammad Kamil. 2002. <i>Mukjizat Ilmiah dalam Al-Qur'an</i>. Akbar.</p> <p>2. Al Hasani, Muhammad Alawy Al Maliki. 1424 H. <i>Ekstrim dalam Pemikiran Agama, Pengaruhnya pada Kemunculan Tindakan Teroris dan Anarkhis</i>. Makkah al Mukarromah.</p> <p>3. Hasymy. 1989. <i>Apa sebab Al-Qur'an tidak bertentangan dengan akal</i>. PT Bulan Bintang. Jakarta.</p>
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Module designation	Biodiversity
Semester(s) in which the module is taught	6
Person responsible for the module	Drs. Trisnadi Widyaleksono C.P., M.Si.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>Biology</i>
Module objectives/intended learning outcomes	<i>Students can describe biodiversity</i>
Content	<i>This lecture discussing the level of biodiversity and preparing reports</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<i>Biodiversity, KLHK</i>

Module designation	Life Cycle Analysis (LCA)
Semester(s) in which the module is taught	6
Person responsible for the module	Febri Eko Wahyudianto, S.T., M.T.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>

Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>General Ecology</i>
Module objectives/intended learning outcomes	<i>Students can make LCA</i>
Content	<i>This lecture discusses LCA in detail from the existing stages</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<i>ISO about LCA</i>

Module designation	Landfill Planning
Semester(s) in which the module is taught	6
Person responsible for the module	Nita Citrasari, S.Si., M.T.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>Solid Waste Management</i>
Module objectives/intended learning outcomes	<i>Students can plan a final waste processing location in an area according to standards that prioritize environmental aspects in design, operation and post-operation.</i>
Content	<i>This lecture discusses sanitary landfill-based TPA planning which includes land requirements, landfill design layout and supporting buildings, waste mining and landfill closure, landfill site selection methods, waste stockpiling, gas and leachate management, leachate processing techniques, stages of landfill planning and supporting buildings, as well as their operation and maintenance.</i>

Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. <i>Reinhart, D. R. dan Townsend, T. G. 1998. Landfill Bioreactor Design and Operation. Lewis Publishers., Pacific Grove.</i> 2. <i>William, P.T. 2005. Waste Treatment and Disposal. John Wiley and Sons.</i> 3. <i>Kementerian Pekerjaan Umum, Diseminasi Sektor Persampahan, 2013.</i> 4. <i>Tchobanoglous, G. dan Frank, K. 2002. Handbook of solid waste management. McGraw-Hill Professional, New York.</i>

Module designation	Environmental Sanitation Infrastructure
Semester(s) in which the module is taught	6
Person responsible for the module	Dr. Nurina Fitriani, S.T.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>General Ecology</i>
Module objectives/intended learning outcomes	<i>Students can design infrastructure</i>
Content	<i>This lecture discusses sanitation infrastructure in Indonesia</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	PU dissemination

Module designation	Environmental Drainage
Semester(s) in which the module is taught	6

Person responsible for the module	Dr. Nurina Fitriani, S.T.
Language	Indonesia
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture</i>
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	<i>Wastewater Distribution System</i>
Module objectives/intended learning outcomes	<i>Students can design a city-scale rainwater distribution system complete with supporting installations, determine the service area and method of rainwater distribution as well as produce a design concept for rainwater distribution systems, supporting buildings and their operation and maintenance.</i>
Content	<i>This lecture discusses the rainwater distribution system including the hydrological analysis system, the calculation of the dimensions of the canal and its complementary buildings, the determination of the service area and service sub-areas, the rainwater catchment area, the criteria for planning a rainwater distribution system, the stages in planning a rainwater distribution system and its supporting buildings , as well as its operation and maintenance.</i>
Examination forms	<i>Written test, oral presentation and essay</i>
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. <i>Permen PU No 12 Tahun 2014 tentang Drainase Perkotaan.</i> 2. <i>Sijotmojo S., Joyce, H., Pandebesie E. S., Salami I.R.S.2002. Perencanaan Sistem Drainase dan Perencanaan Air Limbah Program Magister – Buku Ajar, Pusdiktek KIMPRASWIL, Bandung.</i> 3. <i>ASCE & MPFC. 1969. Design and construction of sanitary and storm sewer. ASCE. Washington D.C.</i> 4. <i>Chow, V.T. 1988. Open Channel Hydraulics. McGraw-Hill International Edition. New York.</i>

SEMESTER VII

Module designation	Wastewater Processing Building Planning
Semester(s) in which the module is taught	7
Person responsible for the module	Dwi Ratri Mitha Isnadina, S.T., M.T.

Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture and assignment
Workload (incl. contact hours, self-study hours)	Lecture = 2 hours 30 minutes Assignment activities = 3 hours Self-study = 3 hours
Credit points	4.8 ECTS
Required and recommended prerequisites for joining the module	Operation and Process Unit
Module objectives/intended learning outcomes	Students are able to properly plan the building of a municipal wastewater treatment plant, operation and maintenance systems, estimate costs and plans for expanding a municipal wastewater treatment plant.
Content	Master plan, municipal wastewater quality, phasing and planning period, processing debit calculation, pre-design: treatment process (preliminary, primary, secondary and tertiary) flow chart, layout of treatment building. Design: calculation of processing building dimensions, hydraulic profiles, equipment, cost estimates, operation and maintenance.
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Nemerow, Nelson Leonard. 1995. Zero pollution for industry, waste minimization through industrial complexes. John Wiley. New York 2. Eckenfelder, W.W., 2000. Industrial water pollution control, 3rd ed. McGraw Hill. New York.

Module designation	Lab Practice for Wastewater Processing Building Planning
Semester(s) in which the module is taught	7
Person responsible for the module	Dwi Ratri Mitha Isnadina, S.T., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Lecture and assignment
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Self-study = 1 hours 10 minutes
Credit points	1.6 ECTS

Required and recommended prerequisites for joining the module	Operation and Process Unit
Module objectives/intended learning outcomes	Students are able to properly plan the building of a municipal wastewater treatment plant, operation and maintenance systems, estimate costs and plans for expanding a municipal wastewater treatment plant.
Content	Master plan, municipal wastewater quality, phasing and planning period, processing debit calculation, pre-design: treatment process (preliminary, primary, secondary and tertiary) flow chart, layout of treatment building. Design: calculation of processing building dimensions, hydraulic profiles, equipment, cost estimates, operation and maintenance.
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	<ol style="list-style-type: none"> 1. Nemerow, Nelson Leonard. 1995. Zero pollution for industry, waste minimization through industrial complexes. John Wiley. New York 2. Eckenfelder, W.W., 2000. Industrial water pollution control, 3rd ed. McGraw Hill. New York.

Module designation	Internship
Semester(s) in which the module is taught	7
Person responsible for the module	Febri Eko Wahyudianto, S.T., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Practice, discussion, and seminar
Workload (incl. contact hours, self-study hours)	Practice = 8 hours 30 minutes
Credit points	4.8 ECTS
Required and recommended prerequisites for joining the module	Have taken at least 144 ECTS
Module objectives/intended learning outcomes	Students are able to carry out practical field work activities in accordance with the competence of the field of knowledge in the world of work, are able to apply skills and knowledge in the workplace according to the tasks carried out during the internship. Able to describe descriptions of tasks and jobs in accordance with scientific competence, and able to identify problems in carrying out tasks during internships in industry or other agencies.
Content	The content for this course follows the student's chosen field of interest

Examination forms	Practice, report, and seminar
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	Buku Pedoman Praktikum Kerja Lapangan, 2012, Departemen Biologi, Fakultas Sains dan Teknologi Universitas Airlangga, Surabaya

Module designation	Community Services
Semester(s) in which the module is taught	7
Person responsible for the module	Gesnita Nugraheni, S.Farm., M.S., Apt.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Practice
Workload (incl. contact hours, self-study hours)	Practice = 8 hours 30 minutes
Credit points	4.8 ECTS
Required and recommended prerequisites for joining the module	Have taken more than 176 ECTS
Module objectives/intended learning outcomes	Students can build togetherness as Universitas Airlangga students towards the end of their studies before earning a bachelor's degree by implementing joint learning programs in the community and with the community and assisting the government in community empowerment and solving complex problems appropriately.
Content	Provision of pre-deployment of community services; preparation for field activities carried out before students are deployed to the location; departure of students to community service locations; preparation of activity plans based on community service themes that have been agreed upon and adapted to the needs of the community; realization of community service programs; assessment of achievement of student activities.
Examination forms	Practice, report, and seminar
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	Buku Pedoman KKN, Universitas Airlangga, Surabaya.

Module designation	Thesis Proposal
Semester(s) in which the module is taught	7

Person responsible for the module	Dr. Eko Prasetyo Kuncoro. S.T., DEA.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory
Teaching methods	Discussion
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	Have taken at least 176 ECTS
Module objectives/intended learning outcomes	Students are able to make a thesis draft, students are able to make a thesis design (proposal) in the field of interest they choose correctly.
Content	Based on students' interest
Examination forms	Report and seminar
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Handbook for Proposals and Thesis of the Faculty of Science and Technology, Airlangga University 2. Depends on the student's chosen field of interest.

Module designation	Industrial Waste Treatment
Semester(s) in which the module is taught	7
Person responsible for the module	Dwi Ratri Mitha Isnadina, S.T., M.T.
Language	Bahasa Indonesia
Relation to curriculum	Elective
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	Operations and Process Unit
Module objectives/intended learning outcomes	Students are able to explain industrial waste management

Content	Industrial waste and its processing methods
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	Environmental Engineering, Tchobanoglous

Module designation	Strategic Environmental Assessment
Semester(s) in which the module is taught	7
Person responsible for the module	Dr. Nurina Fitriani, S.T.
Language	Bahasa Indonesia
Relation to curriculum	Elective
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	General Ecology
Module objectives/intended learning outcomes	Students are able to compose a Strategic Environmental Assessment
Content	Discuss the scope of the Strategic Environmental Assessment
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	Strategic Environmental Assessment, Ministry of Environment and Forestry

Module designation	Rehabilitation, Restoration and Environmental Conservation
Semester(s) in which the module is taught	7
Person responsible for the module	Drs. Trisnadi Widyleksono Catur Putranto, M.Si.
Language	Bahasa Indonesia
Relation to curriculum	Elective

Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	General Ecology
Module objectives/intended learning outcomes	Students are able to explain the concept of conservation
Content	Discuss the environment conservation
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	Atur Diri Sendiri: Paradikma Baru Pengelolaan Lingkungan Hidup, Otto Soemarwoto
Module designation	Economics and Environment Valuation
Semester(s) in which the module is taught	7
Person responsible for the module	Drs. Trisnadi Widyleksono Catur Putranto, M.Si.
Language	Bahasa Indonesia
Relation to curriculum	Elective
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	General Ecology
Module objectives/intended learning outcomes	Students are able to assess the economic value of natural resources
Content	Discuss natural resources, their value and assessment
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	Ministry of Environment and Forestry

SEMESTER VIII

Module designation	Final Project/Thesis
Semester(s) in which the module is taught	8
Person responsible for the module	Dr. Eko Prasetyo Kuncoro, S.T., DEA.
Language	Indonesian
Relation to curriculum	Compulsory
Teaching methods	Seminar, discussion, assignment, and problem solving
Workload (incl. contact hours, self-study hours)	Lecture = 5 hours Assignment activities = 6 hours Self-study = 6 hours
Credit points	9.6 ECTS
Required and recommended prerequisites for joining the module	Passed thesis proposal seminar and all compulsory courses.
Module objectives/intended learning outcomes	Students are able to compile research results in the form of a thesis script in accordance with the guidelines for preparing a thesis, and provide arguments regarding the results of research at the hearing before the examiner correctly.
Content	Implementation of research, further literature study, consultation with the supervisor during the implementation of research, preparation of manuscripts in accordance with the guidelines for preparing a thesis with the approval of the supervisor, presenting and providing arguments regarding the results of research at the hearing before the examiner. The material of this course follows the field of interest chosen by the student.
Examination forms	Research results and presentation
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	1. Guidebook for Proposal and Thesis Faculty of Science and Technology, Universitas Airlangga 2. Depending on the field of interest chosen by the student.

Module designation	Current Issues in Environmental Engineering
Semester(s) in which the module is taught	8
Person responsible for the module	Dr. Eko Prasetyo Kuncoro, S.T., DEA.
Language	Indonesian
Relation to curriculum	Elective
Teaching methods	Lecture

Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	No required course
Module objectives/intended learning outcomes	Students are able to explain current issues
Content	This course discusses current issues and global warming
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	Journal article

Module designation	Environmental Engineering Materials Knowledge
Semester(s) in which the module is taught	8
Person responsible for the module	Wahid Dianbudyanto S.T., M.T.
Language	Indonesian
Relation to curriculum	Elective
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	Basic of Physics
Module objectives/intended learning outcomes	Students are able to explain the material and characteristics
Content	This course discusses materials, characteristics and utilization
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	Engineering Materials, Williams

Module designation	Environmental Modelling
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Semester(s) in which the module is taught	8
Person responsible for the module	Dwi Ratri Mitha Isnadina S.T, M.T
Language	Indonesian
Relation to curriculum	Elective
Teaching methods	Lecture, discussion, assignment
Workload (incl. contact hours, self-study hours)	Lecture = 1 hours 40 minutes Assignment activities = 2 hours Self-study = 2 hours
Credit points	3.2 ECTS
Required and recommended prerequisites for joining the module	Differential Equation
Module objectives/intended learning outcomes	Students are able to do modelling
Content	Explain the steps of modeling, types of models, software that supports modeling in the field of Environmental Science and Technology, and practice some software.
Examination forms	Written test and assignment
Study and examination requirements	Minimum attendance of 75% to take the exam and minimum final grade of D to pass the module
Reading list	Env Eng System, Rich