MODULES HANDBOOK



UNESA

UNDERGRADUATE PROGRAM IN SCIENCE EDUCATION
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
UNIVERSITAS NEGERI SURABABAYA
2021

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COMPULSORY COURSES

SEMESTER I

Module Name:	*Pendidikan Pancasila* (Pancasila)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	1000002020
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	1/ first year (freshman)
Module coordinator(s):	Viky Dwi Wicaksono
Lecturer(s):	Viky Dwi Wicaksono
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 79.33 total hours per semester ~ 3.18 ECTS**
Credit point:	2 *sks* (3.18 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Identify and resolve national and state development problems in the perspective of the basic values of Pancasila as the ideology and basis of Indonesian. 2. Apply the basic values of Pancasila as the principles and guidelines for living in society, nation and state. 3. Make the right decisions in dealing with problems in the life of the community, nation and state based on the values of Pancasila. 4. Have responsible, caring, honest, cooperative attitudes, respecting opinions and having a love for the country in implementing and preserving the values of Pancasila in reality and everyday life.
Content:	This course discusses the concept and essence of Pancasila as the basis and ideology of the nation, as well as the guide of life. This course also examines the Pancasila historically, juridically and philosophically and its actualization in the life of the nation. Pancasila as a foundation in Political Ethics and Development Paradigm and its implementation in the life of society and nation.
Attribute Soft skill:	Active communication
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

	<table><tr><th>Assessment Components</th><th>Percentage Contribution</th></tr><tr><td>Participation</td><td>20%</td></tr><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table>
Learning Methods	Presentation, discussion, and case study.
Form of Media:	Videos, PPT-based slides, Handouts and worksheet.
Literature (primary references):	1. Tim MKU Pendidikan Pancasila Unesa. 2019. *Pendidikan Pancasila*. Surabaya: Unesa University Press. 2. Direktorat Jenderal Pendidikan Tinggi. 2012. *Materi Ajar Mata Kuliah Pendidikan Pancasila*. Jakarta: Direktorat Pembelajaran dan Kemahasiswaan. 3. Syarbaini, Syahrial. 2011. *Pendidikan Pancasila: Implementasi Nilai-nilai Karakter Bangsa di Perguruan Tinggi*. Bogor: Ghalia Indonesia. 4. Latif, Yudi. 2011. *Negara Paripurna: Historisitas, Rasionalitas, dan Aktualitas Pancasila*. Jakarta: PT. 5. Latif, Yudi. 2014. *Mata Air Keteladanan*. Pancasila dalam Perbuatan. 6. Pusat Studi Pancasila UGM. 2012. *Pancasila Dasar Negara*. Yogyakarta: PSP Press. 7. Thaib, Dahlan. 1991. *Pancasila Yuridis Ketatanegaraan*. Yogyakarta: UPP AMP YKPN 8. Warsono. 2014. *Pancasila-Isme dalam Dinamika Pendidikan*. Surabaya: Unesa University Press 9. Majelis Permusyawaratan Rakyat Indonesia (MPRRI). 2002. *Undang-Undang Dasar 1945 Hasil Amandemen IV*. 10. Suplemen Arah Pembangunan (RPJM) 2014. -*2019*.
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Bahasa Inggris* (English)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103012
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	1/ first year (freshman)
Module coordinator(s):	An Nuril Maulida Fauziah, S.Pd., M.Pd.
Lecturer(s):	Wahyu Budi Sabtiawan, S.Si., M.Pd., M.Sc. Dhita Ayu Permata Sari, S.Pd., M.Pd. Aris Rudi Purnomo, S.Si., M.Pd., M.Sc. Enny Susiyawati, S.Si., M.Sc., M.Pd., Ph.D.
Language:	*Bahasa Indonesia* (Indonesian Language as medium of instruction)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Apply English language skills and utilize ICT to understand written and oral information in everyday and general contexts. 2. Communicate using acceptable English orally or in written forms. 3. Make decisions in choosing the correct English language according to the acceptable rules. 4. Have responsibility to use English in daily conversation and to complete assignments related to the understanding of English.
Content:	This course equips students with the skills and knowledge of language components at the basic level (pre-intermediate). The courses also introduces standardized tests that include exercises for reading skills, listening comprehension) and structure and vocabulary which is directed to the preparation of the English test International standards.
Attribute Soft skill:	Active communication

<table>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table><tr><th>Assessment Components</th><th>Percentage Contribution</th></tr><tr><td>Participation</td><td>20%</td></tr><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table></td></tr>
<tr><td>Learning Methods</td><td>Lecture and discussion.</td></tr>
<tr><td>Form of Media:</td><td>Videos, PPT-based slides, Handouts and worksheet.</td></tr>
<tr><td>Literature (primary references):</td><td>1. Sharpe, Pamela. J. 2003. How to prepare for the TOEFL. Barron 19s Educational Series.
2. Phillips, Deborah. 2004. Longman Preparation Course for the TOEFL Test: The Paper Test (Student Book with Answer Key and CD-ROM). Pearson Education.
3. _____. 2012. Official Guide to the TOEFL Test With CD-ROM, 4th Edition (Official Guide to the Toefl Ibt). McGraw-Hill.
4. Phillips, Deborah. 2001. Longman Introductory Course for the TOEFL Test: iBT, 2nd ed. Pearson Education.
5. Worcester, Adam, et al. 2008. Building Skill for the TOEFL iBT: Beginning. Compass Publishing.
6. Cullen, Pauline, et al. 2014. The Official Cambridge Guide to IELTS Student's Book With Answers with DVD-ROM. Oxford University Press.
7. Parthare, Emma; Parthare, Gary; May, Peter. 2013. Headway Academic Skills IELTS Study Skills Edition: Level 1 Student's Book. Oxford University Press.
8. Lougheed, Lin. 2007. Longman Preparation Series for the TOEIC Test: Listening and Reading, 5th Edition. Pearson Education.
9. Tim Mata Kuliah Bahasa Inggris Unesa. 2015. English for Non English Department Students (Untuk Kalangan Sendiri). Surabaya: Unesa.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Fisika Umum* General Physics
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103045
Abbreviation, if applicable:	FU
Courses included in the module, if applicable:	Not applicable
Semester/term	I / first year (freshman)
Module coordinator(s):	Dr. Mohammad Budiyanto, M.Pd.
Lecturer(s):	Dr. Mohammad Budiyanto, M.Pd. Tutut Nurita, S.Pd.,M.Pd. Muhamad Arif Mahdiannur, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Utilizing science and technology to make representations of physical symptoms (mechanics and heat energy) in the form of graphs, data tables, mathematics, and information retrieval 2. Analyze facts, concepts, principles, laws, theories and procedures in the field of mechanics and thermal energy for solving relevant problems. 3. Able to make strategic decisions based on data and information in mechanics and heat energy. 4. Responsible for self-learning, assignments, and agreements with colleagues.
Content:	This course discusses the concepts and principles / laws of measurement, kinematics, dynamics, temperature, heat, and heat transfer.
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

	<table><tr><th>Assessment Components</th><th>Percentage Contribution</th></tr><tr><td>Participation</td><td>20%</td></tr><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table>
Learning Methods	Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities), and flip learning
Form of Media:	LCD, PowerPoint, hand out, simulation, e-learning Vinesa, and whiteboard
Literature (primary references):	1. Giancoli, Douglas. 2016. Physics: *Principles with Applications II Global Edition*. California: Addison-Wesley. 2. Halliday & Resnick. 2013. *Fundamental of Physics*, 10th Edition. John Wiley & Sons Inc. Young, Hugh D., Freedman, Roger A., Ford, 3. Albert Lewis. 2016. *Sears and Zemansky's University Physics: With Modern Physics*. Pearson.
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Kimia Umum* (General Chemistry)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103045
Abbreviation, if applicable:	Kimia Umum
Courses included in the module, if applicable:	Not applicable
Semester/term	I/one (yunior)
Module coordinator(s):	Dr.Erman.M.Pd.
Lecturer(s):	**Prof. Dr. Erman** **Dra. Martini, M.Pd** **Siti Nurul Hidayati, S.Pd., M.Pd.** **Wahyu Sabtiawan, S.Si., M.Pd** **Ernita Vika Aulia,S.Pd.M.Pd.**
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** 1. Capable to use science and technology to obtain information on basic chemical concepts and communicate them 2. Mastering the basic concepts of chemistry in the study of material properties 3. Able to solve basic chemistry problems in science learning 4. Mastering the basic concepts of chemistry including atoms, ions, and molecules, chemical bonds, basic chemical concepts including elements, compounds, and mixtures
Content:	Scientific Method, Matter and Properties of Matter, Periodic System of Elements, Chemical Bonds, Stoichiometry, Solutions, Colloid Systems,
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table>
<tr><td></td><td>
<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint, hand out, simulation, and whiteboard and e-learning unesa (https://vinesa.unesa.ac.id/course/view.php?id=423)</td></tr>
<tr><td>Literature (primary references):</td><td>1. Tim Kimia Umum. 2013. Kimia Umum .Surabaya: Jurusan Kimia FMIPA Unesa.
2. Brady, James.E. 2004. General Chemistry. Principle and Structure. 4th. ed. New York. John Willey and Sons, Inc.
3. Chang, Raymond. 2005. General Chemistry The Essential Concepts Third Edition. USA: McGraw Hill.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Biologi Umum* (Basic Biology)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103158
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	1/first year
Module coordinator(s):	Dyah Astriani, S.Pd., M.Pd
Lecturer(s):	Dr. Yuliani, M.Si. Ahmad Qosyim, S.Si., M.Pd. Enny Susiyawati, S.Si., M.Pd., M.Sc., Ph.D Dhita Ayu Permata Sari, S.Pd., M.Pd
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Mastering the basic concepts of biology and conducting experiments: scientific method, cell structure and function, metabolism, photosynthesis and respiration), genetics, diversity of living things and nomenclature; 2. Mastering the basic concepts of biology and conducting experiments: the origin of life, evolution, structure of plant and animal organ tissue functions, ecology, organism behavior and biotechnology; 3. Applying the principles of the scientific method to discussing various natural phenomena that are catastrophic to the life of organisms; 4. Designing observations about living organisms and making reports
Content:	Scientific methods, Structure and function of cell, Characteristics and Classification of Living Things, metabolism, genetic, biodiversity, origin of living, structure and function of plant tissue, nomenclature, ecology, biotechnology, inheritance
Attribute Soft skill:	Be autonomous, honest, discipline, comunication, collaboration, responsibility, analyze data and information, problem solving, and argumentation in the natural classroom setting
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

Assessment Components	Percentage Contribution
Participation	20%
Assignment	30%

	<table><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table>
Learning Methods	Student-centered approach, respository, lecturing, discussion, presentation (structured activities), laboratory activities
Form of Media:	LCD, PowerPoint, hand out, worksheet, simulation, internet, and whiteboard
Literature (primary references):	1. Campbell, Neil A, Jane B.Reece dan Lawrence G.Mitchell. 2003. *Biologi*. California: Benjamin Cummings 2. Kimball, J.W. 1989. *Biologi Jilid I, II, III*. Edisi Kelima 3. Rachmadiarti, F.,Yuliani, Widowati B., Rinie P, Mahanani T.A,Dyah H.,Herlina F. 2007. *Biologi Umum*. Surabaya: UNESA Press. 4. 4. Luria. 1981. *A View of Life*. California: Benyamin Cumming. 5. Johnson, Raven. *Biology.*Third Edition. 6. Reece, Taylor, Simon, dan Dickey. 2012. *Campbell Biology, Concepts and Connection*s. Eleventh Edition. San Francisco: Pearson Education, Inc. 7. Reece, Urry, Cain, Waserman, Minorsky, dan Jackson. 2011. *Campbell Biology.* Ninth Edition. San Francisco: Pearson Education, Inc. 8. Solomon, B., dan Martino. 2008. *Biology.*Eight Edition. Belmont, CA: Thomson, Brooks/Cole. 9. Rujukan lain dalam bentuk berbagai artikel dalam jurnal atau *proceeding* internasional dan nasional yang terkini dan termutakhir (5-10 tahun terakhir).
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Bahasa Indonesia* (Indonesian)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	1000002003
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	III/second year (freshman)
Module coordinator(s):	Prima Vidya Asteria, S.Pd., M.Pd.
Lecturer(s):	Prima Vidya Asteria, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 79 total hours per semester ~ 3.18 ECTS**
Credit point:	2 *sks* (3.18 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Understand the concept of using Indonesian properly and correctly; 2. Able to speak Indonesian language and literature, orally and in writing in everyday / general, academic and work contexts; 3. Able to write a variety of standard written communication, especially scientific writing;
Content:	The course aims to equip students with the ability to understand and use Indonesia Language in scientific written communication. This course teaches students about the types of standard written communication based on Standard Indonesian Grammar and Indonesian Spelling.
Attribute Soft skill:	Collaboration, communication, and argumentation in the natural classroom setting.
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

Assessment Components	Percentage Contribution
Participation	20%
Assignment	30%
Mid-semester test	20%
Final semester test	30%

	Total | **100%**
Learning Methods	Discussion, presentation (structured activities), and lecturing
Form of Media:	LCD, PowerPoint slides, whiteboard, and virtual learning platform
Literature (primary references):	1. Indonesia, T. R. K. B. (2008). Kamus Bahasa Indonesia. Jakarta: Pusat Bahasa Departemen Pendidikan Nasional, 725. 2. Indonesia, T. P. P. B. (2016). Pedoman umum ejaan bahasa Indonesia. Jakarta: Badan Pengembangan dan Pembinaan Bahasa. 3. Alwi, H., Dardjowidjojo, S., Lapoliwa, H., & Moeliono, A. M. (2019). Tata bahasa baku bahasa Indonesia. 4. Wiyanto, A. (2012). Kitab Bahasa Indonesia. Galangpress Publisher.
Notes:	*__1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)__ according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	**__1 sks = 1,59 ECTS__

Module Name:	*Matematika Dasar* Basic mathematic
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103086
Abbreviation, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	I / fourth year (senior)
Module coordinator(s):	Dr. Rini Setianingsih, M.Kes.
Lecturer(s):	Evangelista Lus Windyana Palupi., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** 1. Knowledge CLO-1: Explain the basic notions of mathematics as a deductiveaxiomatic structure, structured thinking, reasoning, and rational-deductive logic, set, relationship, function, logic, quantor, conclusion, and validity of proof or conclusion. 2. Skill CLO-2: Mathematically state a statement problem in the form of a mathematical relation, function, or statement and solve it 3. Competency CLO-3: Prove mathematical statements using several suitable methods
Content:	System and deductive-axiomatic structure, logical operation, quantifier, making a conclusion, set theory, relation, function, and POSET.
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

Assessment Components	Percentage Contribution
Participation	20%
Assignment	30%

	Mid-semester test: 20% Final semester test: 30% **Total: 100%**
Learning Methods	Constructivism, student-centered approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning
Form of Media:	LCD, PowerPoint slides, worksheets
Literature (primary references):	1. Stoll, R. R. 1979. Set Theory and Logic. New York: Dover Publication, Inc. 2. Masriyah, 2017. Dasar-Dasar Matematika, Surabaya: Unesa Press. 3. Yunus, M. 2007. Logika: Suatu Pengantar. Yogyakarta: Graha Ilmu. 4. Kunnen, K. 2009. The Foundation of Mathematics Vol 19. London: College Publications
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Dasar-Dasar Pendidikan* Basic of Education
Module Level:	Bachelor Degree/Undergraduate Program
Course Code:	8420103067
Abbreviation, if applicable:	DDP
Sub-heading, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	I/first year (freshmen)
Module coordinator(s):	Ahmad Qosyim, S.Si., M.Pd.
Lecturer(s):	Prof. Dr. Erman, M.Pd. Ahmad Qosyim, S.Si., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory Course / ~~Elective Studies~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	
Learning goals/competencies:	**Course Learning Outcomes (CLO):** After taking this course, university students have ability to; 1. Able to apply the field of educational expertise and take advantage of science and technology in solving problems related to education both theoretically and practically and able to adapt to the situation at hand 2. Mastering theoretical concepts about education in depth and able to formulate procedural problem solving. 3. Able to make correct decisions based on analysis of information and data and able to provide guidance in choosing various alternative solutions independently and in groups. 4. Responsible for the performance of self-learning, agreement with group colleagues in understanding the basic concepts of education both theoretically and practically and being able to properly apply relevant educational theories in the field of education.

<table>
<tr><td></td><td>Sub-CLOs:
1. Understand the Basic Concepts of Education
2. Understanding Human Nature and Its Development,
3. Understanding The Nature of Education
4. Understanding education as a system
5. Understanding the national education system
6. Understand the foundation of education
7. Understand the concept of the teacher as a profession
8. Understanding educational problems
9. Understanding educational innovation in Indonesia
10. Understand character education</td></tr>
<tr><td>Content:</td><td>Study of the basic concepts of education, human nature and its development, nature and foundation of education, education as a system, the national education system, the foundation of education, teachers as a profession, educational problems, educational innovation in Indonesia, and character education.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Constructivism, student-centered approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets,</td></tr>
<tr><td>Literature (main references):</td><td>Main references:
1. M.V. Roesminingsih dan Lamijan Hadi Susarno. 2015. Teori Dan Praktek Pendidikan. Surabaya: Lembaga Pengkajian dan Pengembangan Ilmu Pendidikan Fakultas Ilmu Pendidikan Universitas Negeri Surabaya kerjasama dengan Penerbit Bintang.
2. Tim Redaksi Pustaka Yustisia. 2009. Kompilasi Perundangan Bidang Pendidikan: Seri Kompilasi Perundangan Terlengkap dan Terbaru. Yogyakarta: Pustaka Yustisia.

Additional references:
1. Furqon Hidayatullah. 2010. Pendidikan Karakter: Membangun Peradaban Bangsa. Surakarta: Yuma Pustaka.
2. Zaim Elmubarok. 2009. Membumikan Pendidikan Nilai:</td></tr>
</table>

	Mengumpulkan Yang Terserak, Menyambung Yang Terputus dan Menyatukan Yang Tercerai. Bandung: Alfabeta. 3. Early, Peter & Bubb, Sara. 2004. *Leading and Managing Continuing Professional Development*. London: Paul Chapman Publishing. 4. OECD. 2003. *Networks of Innovation: Towards New Models for Managing Schools and Systems.* Paris: OECD Publications. 5. Townsend, Tony. 2007. *International Handbook of Schools Effectiveness and Improvement*. Netherlands: Springers. 6. Hawley, Willis D. 2007. *The keys to Effective Schools: Educational Reforms as Continous Improvement.* United Kingdom: A Sage Publications Company. 7. Zajda, Joseph & Gamage, David T. 2009. Decentralisation, School Based Management and Quality. New York: Springer
Notes:	*__1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)__ according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	**__1 sks = 1,59 ECTS__

SEMESTER II

Module Name:	*Pendidikan Agama Islam* (Islamic Religion)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	1000002026
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	1/ first year (freshman)
Module coordinator(s):	Dr. HM. Turhan Yani, MA
Lecturer(s):	Dr. HM. Turhan Yani, MA Drs. HM. Husni Abdullah, M.Pd Dr. Khoirul Anwar, M.EI Dr. Mutimmatul Faidah, M.Ag Ary Subagya, Lc., M. Fil. I Dr. Abidah S., M. Pd Nurul Hikmah, M. HI Ahmad Ajib Ridlwan, S. Pd., M. SEI. Ahmadun Najah, M. HI
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 79.33 total hours per semester ~ 3.18 ECTS**
Credit point:	2 *sks* (3.18 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Explore data/information in the context of learning Islamic Religious Education including insight / knowledge about Islam, religious attitudes, skills in carrying out Islamic teachings, commitment to Islam, self-confidence as a Muslim, and proficiency in implementing religious teaching. 2. Recognize theoretical concepts about Islamic knowledge according to references. 3. Have mindset, attitude and behavior that reflects a good Muslim personality who has the ability to do religious teaching. 4. Have responsible, caring, honest, and cooperative attitudes, respect others' opinions and love the country in implementing and preserving the values of Pancasila in reality and everyday life.

<table>
<tr><td>Content:</td><td>This course provides provisions for the formation of students' personality as a whole by making Islamic teachings as a basis for thinking and behaving in scientific and professional development. A complete personality can only be realized if each student has faith and piety to Allah SWT. Faith and piety will only be realized if it is supported by the development of its elements, namely: insight / knowledge about Islam (Islamic knowledge), religious attitudes (religion dispositions), skills in carrying out Islamic teachings (Islamic skills), commitment to Islam, self-confidence as a Muslim (moslem confidence), and proficiency in implementing religious teachings (Islamic competence). In the psycho-social constellation, either as individuals, family members, community members, or as Indonesian citizens. This course upholds divine values, humanity, unity, deliberation and justice within the framework of Pancasila and NKRI. This course also integrates Anti-Corruption Education material and religious moderation.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Active communication</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table><tr><th>Assessment Components</th><th>Percentage Contribution</th></tr><tr><td>Participation</td><td>20%</td></tr><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table></td></tr>
<tr><td>Learning Methods</td><td>Presentation, discussion, case study, problem solving, and project-based learning.</td></tr>
<tr><td>Form of Media:</td><td>Videos, PPT-based slides, Handouts and worksheet.</td></tr>
<tr><td>Literature (primary references):</td><td>1. Alquran dan Terjemahannya. 2014. Jakarta: Kementerian Agama Republik Indonesia.
2. Ausop, Asep Zaenal. 2014. Islamic Character Building. Bandung: Salamadani.
3. Sauqi, Achmad. 2010. Meraih Kedamaian Hidup: Kisah Spiritualitas Orang Modern. Yogyakarta: Sukses Offset.
4. Praja, Juhaya S. 2002. Filsafat dan Metodologi Ilmu dalam Islam dan Penerapannya di Indonesia. Jakarta: Teraju.
5. Maman. 2012. Pola Berpikir Sains Membangkitkan Kembali Tradisi Keilmuan Islam. Bogor: QMM Publishing.
6. Rahmat, Munawar. 2010. Pendidikan Insan Kamil Berbasis Sufisme Syaththariah. Bandung: ADPISI Press.
7. Mustaqim, Abdul. 2012. Epistemologi Tafsir Kontemporer. Yogyakarta: LKIS.</td></tr>
</table>

	8. Madjid, Nurcholis. 2008. *Islam Kemoderenan dan Keindonesiaan*. Bandung: PT Mizan Pustaka. 9. Anonym. 2008. *Islam Agama Peradapan*. Jakarta: Paramadina. 10. Sukidi. 2002. *Kecerdasan Spiritual* . Jakarta: Gramedia. 11. Syahidin. 2005. *Pemberdayaan Umat Berbasis Masjid*. Bandung: CV Alfabeta. 12. Tim Penulis Kemendikbud. 2014. *Pendidikan Agama Islam pada Perguruan Tinggi Umum*. Jakarta: Kementerian Pendidikan dan Kebudayaan Republik Indonesia. 13. Tim Dosen PAI-Unesa. 2010. *Pendidikan Agama Islam pada Perguruan Tinggi Umum*. Surabaya: Unesa University Press. 13. Toshihiko, Izutsu. 2003. *Konsep-konsep Etika Religius dalam Al-Quran*. (Penerjemah AE Priyono dkk). Yogyakarta: Tiara Wacana Yogya.
Notes:	*__1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)__ according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	**__1 sks = 1,59 ECTS__

Module Name:	*Pendidikan Kewarganegaraan* (Citizenship Education)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	1000002033
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	II/first year (freshman)
Module coordinator(s):	Drs. I Made Suwanda, M.Si.
Lecturer(s):	Septina Alrianingrum, S.S., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 79.3 total hours per semester ~ 3.18 ECTS**
Credit point:	2 *sks* (3.18 ECTS)
Requirements:	–
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Utilizing information technology to trace data / information in order to identify and resolve national and state development problems in the perspective of the basic values of Pancasila as the ideology and basis of the Indonesian state; 2. Have knowledge of the basic values of Pancasila as the principles and guidelines for living in society, nation and state; and 3. Have knowledge of the basic values of Pancasila as the principles and guidelines for living in society, nation and state.
Content:	This subject is an introduction to the nature of Civics, which is continued by discussing the rights and obligations of citizens in accordance with the constitution in the context of national identity and national integration, implemented democratically and based on applicable law. Then deepened by talking about law enforcement and Human Rights, Gender, Archipelago Insights, followed by National Resilience and ending on Anti-Corruption Education. Lectures are carried out with a system of case study analysis, presentations and discussions, problem solving tasks (problem solving), and reflection.

<table>
<tr><td></td><td></td></tr>
<tr><td>Attribute Soft skill:</td><td>Good active communication</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table><tr><th>Assessment Components</th><th>Percentage Contribution</th></tr><tr><td>Participation</td><td>20%</td></tr><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table></td></tr>
<tr><td>Learning Methods</td><td>Lectures, questions and answers and discussions, presentations.</td></tr>
<tr><td>Form of Media:</td><td>Videos, PPT-based slides, Handouts and LKM.</td></tr>
<tr><td>Literature (primary references):</td><td>1. Affandi, Idrus dan Karim Suryadi. 2005. Hak Asasi Manusia. Jakarta : Pusat Penerbitan Universitas Terbuka
2. Cogan, Johan L danMurry Print. 2012. Civic Education in The Asia Pasific Regional. Roeledge. ISBN - 0415932130
3. Niemi, Richard G dan Jane Junn. 2005. Civic Education: What Make Student Learn. The University of Chicago Press.
4. S. Sumarsono, dkk, Pendidikan Kewarganegaraan, Penerbit PT. Gramedia Pustaka Utama, Jakarta, 2001
5. Tim Dosen UGM. 2002. Pendidikan Kewarganegaraan. Yogyakarta: Paradigma
6. ….., UU RI No. 3 Tahun 2002 tentang Pertahanan Negara. Penerbit “Citra Umbara”, Bandung, 2002
7. UU No 12 Tahun 2006 tentang Kewarganegaraan RI . Penerbit “Cemerlang”, Jakarta, 2006.
8. UU yang relevan dengan materi pembelajaran.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	Literasi Digital (*Digital Literacy*)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	
Abbreviation, if applicable:	Literasi Digital
Courses included in the module, if applicable:	Not applicable
Semester/term	III/second year (junior)
Module coordinator(s):	Shofan Fiangga, S.Pd., M.Sc.
Lecturer(s):	Aditya Prapanca, ST, M.Kom. Shofan Fiangga, S.Pd., M.Sc.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 15 weeks per semester, 90 total hours per semester ~ 3.18 ECTS**
Credit point:	2 *sks* (3.18 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** 1. Be able to examine the importance of digital literacy in facing the challenges and opportunities of the 21st century. 2. Able to study the basic principles of digital literacy development. 3. Able to examine various features of digital technology and communication tools that are useful in life. 4. Skilled in using digital technology and communication tools to access and manage (filter, analyze, evaluate, and integrate) digital information effectively. 5. Skilled in using digital technology and communication tools effectively to create and build new knowledge. 6. Skilled in using digital technology and communication tools effectively to communicate with others and play an active role in the global community
Content:	This course is a course that develops interests, attitudes and abilities of individuals using digital technology and communication tools to access, manage, integrate, analyze and evaluate information, build new knowledge, create, and communicate with others in order to participate effectively.
Attribute Soft skill:	Team work, Good scientist, Long life education
Study/exam achievements:	Students are considered to be competent and pass if at

<table>
<tr><td></td><td>least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

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<tr><td>Learning Methods</td><td>Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint, hand out, e- book</td></tr>
<tr><td>Literature (primary references):</td><td>1. Hartley J., 2017, The Uses of Digital Literacy, New York: Routledge Published
2. Ministry of Education and Culture, 2017, National Literacy Movement: Digital Literacy Support Materials, Jakarta: Ministry of Education and Culture.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Matematika IPA* (Mathematics for Science)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103088
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	II/first year (freshmen)
Module coordinator(s):	Dr. Mohammad Budiyanto, M.Pd.
Lecturer(s):	Dr. Mohammad Budiyanto, M.Pd. Tutut Nurita, S.Pd., M.Pd. Muhamad Arif Mahdiannur, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	General Physics (8420103045) General Chemistry (8420103074) General Biology (8420103023)
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Apply substantive and procedural concepts of linear algebra and vector calculus to solve the real-world problem related to science phenomena; 2. Apply substantive and procedural concept of differential and integral to solve the real-world problem related to science phenomena; and 3. Apply substantive and procedural concepts of ordinary differential equations (ODEs) to solve the real-world problem related to science phenomena.
Content:	Linear algebra, vector calculus, differential, integral, and ordinary differential equations
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

Assessment Components	Percentage Contribution
Participation	20%

<table>
<tr><td></td><td>
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<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Constructivism, student-centred approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets, software (Matlab/Octave/Scilab), and e-learning Vinesa (https://vilearning.unesa.ac.id/course/view.php?id=3806)</td></tr>
<tr><td>Literature (primary references):</td><td>1. Boas, M. L. (2006). Mathematical methods in the physical science (3rd Ed.). John Wiley & Sons.
2. Kreyszig, E. (2006). Advanced engineering mathematics (9th Ed.). John Wiley & Sons.
3. Arfken, G. B., Weber, H. J., & Harris, F. E. (2013). Mathematical methods for physicists: A comprehensive guide (7th Ed.). Academic Press.
4. Goodson, D. Z. (2011). Mathematical methods for physical and analytical chemistry. Wiley.
5. Logan, J. D., & Wolensensky, W. (2009). Mathematical methods in biology (Vol. 96). John Wiley & Sons.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Psikologi Pendidikan* (Educational Psychology)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	1000002039
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	II/first year (freshman)
Module coordinator(s):	Ni Wayan Sukmawati Puspitadewi, S.Psi, M.Psi.
Lecturer(s):	Elizabeth Christiana, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 79.3 total hours per semester ~ 3.18 ECTS**
Credit point:	2 *sks* (3.18 ECTS)
Requirements:	–
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Mastering the basic concepts of educational psychology, student development, learning theory, and aspects of personality that affect learning, and class management 2. Make decisions about concepts and theories within the scope of educational psychology that are relevant to solving specific learning cases or learning difficulties in the classroom. 3. Responsible for the performance of learning individually and in groups, by showing active involvement in carrying out the tasks and roles given both individually and in groups during the learning process. 4. Make use of learning resources and ICT-assisted learning media to support the implementation of learning.
Content:	The basic concepts of educational psychology, the basic concepts of student development, the laws of student development, Piaget and Vygotsky's theory of cognitive development, Erikson's theory of social emotional development and Kohlberg's moral development, behavioral approaches to learning theories and Bandura's

<table>
<tr><td></td><td>social learning theory, humanistic learning theory , the concept and role of intelligence in learning, emotions and self-concept of students, the role of emotions and self-concept of students on learning processes and outcomes, understanding of motivation, types of motivation, theories of motivation, understanding of giftedness and characteristics, special education for gifted children, concepts basic academic learning difficulties and their forms and characteristics, school guidance and counseling.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Good active communication</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Contextual instruction, discussions, case studies, assignments, and presentations.</td></tr>
<tr><td>Form of Media:</td><td>Books 1-4</td></tr>
<tr><td>Literature (primary references):</td><td>1. Slavin, Robert E. (2011). Psikologi Pendidikan: Teori dan Praktik edisi ke-9.(Jilid 1 & 2). Jakarta: PT Indeks.
2. Santrock, J. W. (2013). Psikologi Pendidikan (jilid 1&2). Jakarta: Salemba Humanika
3. Djiwandono, Sri. Esti. W. (2009). PsikologiPendidikan, Jakarta: Grasindo.
4. Nursalim, M., dkk. (2007). Psikologi Pendidikan. Surabaya: Unesa University Press.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Dasar-dasar IPA* (Introductory of Natural Science)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420102028
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	II/first year (freshman)
Module coordinator(s):	Dr. Elok Sudibyo, M.Pd.
Lecturer(s):	Dr. Elok Sudibyo, M.Pd. Dra. Martini, M.Pd. Ahmad Qosyim, S.Si., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	– General Chemistry – General Physics – General Biology
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Utilizing science and technology as a tool for science development; 2. Mastering the nature and scope of science, science as inquiry, KPS, analysis of aspects of science content, thinking skills and literacy; 3. Skilled in conducting scientific inquiry activities with the content and context of the SMP / MTs curriculum; and 4. Developing a student attitude that is responsible, open to criticism, cooperation and cares about time.
Content:	Nature and scope IPA; inquiry; science process skills; physical fisis; world life; particle theory, change matter, reaction; thinkingskill; literacy of science; history of science.
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table>
<tr><td></td><td>
<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Problem-based learning, lecturing, discussion, and presentation (structured activities).</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets, and e-learning Vinesa (https://vilearning.unesa.ac.id/course/view.php?id=10011568)</td></tr>
<tr><td>Literature (primary references):</td><td>1. Kemdikbud. 2008. BSE IPA SMP CTL. Jakarta: Kemdikbud.
2. Kemdikbud. 2016. BS IPA SMP K13. Jakarta: Kemdikbud.
3. NRC. 2012. National Science Education Standards. Washington: NAP.
4. Rutherford, F.J. & Ahlgreb, A. 1990. Science for All American. New York: Oxford University Press.
5. Suryanti, Mintohari, Widodo, W. 2004. Pengembangan Pembelajaran IPA. Surabaya: Unesa University Press.
6. Tim MIPA Unesa. 2007. Sains Dasar. Surabaya: Unesa University Press.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Undergraduate Programme in Science Education **Module Handbook**

Module Name:	*Teori Belajar* (Learning Theories)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103155
Abbreviation, if applicable:	TB
Courses included in the module, if applicable:	Not applicable
Semester/term	II/first year (freshman)
Module coordinator(s):	Enny Susiyawati, S.Si., M.Sc., M.Pd., Ph.D
Lecturer(s):	Prof. Dr. Erman, M.Pd. Enny Susiyawati, S.Si., M.Sc., M.Pd., Ph.D. Tutut Nurita, S.Pd., M.Pd. An Nuril Maulida, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Explain learning theories that are relevant for integrated science teaching and learning. 2. Apply the knowledge of learning theories to various teaching and learning phenomena. 3. Apply substantive concepts in learning theories to solve relevant problems. 4. Design and simulate a learning activity based on a particular learning theory.
Content:	Behavioristic learning theories, Social learning theories, Cognitive learning theories, Constructivist learning theories, Motivational learning theories, and Humanistic learning theories.
Attribute Soft skill:	Discipline, collaboration, responsibility, and critical thinking.
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table>
<tr><td></td><td>
<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Constructivist, student-centre approach, discussion, students' presentation, and simulation.</td></tr>
<tr><td>Form of Media:</td><td>White Board, LCD projector, Laptop, internet, power point slides, and worksheet.</td></tr>
<tr><td>Literature (primary references):</td><td>1. Hergenhahn, B. R. & Olson, Matthew H. 2012. Theories of Learning (Teori Belajar). Edisi Ketujuh. Jakarta: Kencana Prenada Media Group.
2. Santrock, J. W. 2008. Educational Psychology. Third Edition. Boston: McGraw-Hill.
3. Slavin, R. E. 2011. Psikologi Pendidikan Teori dan Praktik. Edisi Kesembilan Jilid 1. Jakarta: PT Indeks.
4. Woolfolk, A. 2010. Educational Psychology, Global Edition. Eleventh Edition. New Jersey: Pearson Education.
5. Scunk, D. H. 2012. Learning Theories: An Educational Persepctives. Sixth Edition. New Jersey: Pearson Education.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Dasar-Dasar Komputer* (Basic Computer)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420102032
Abbreviation, if applicable:	Not applicable
Courses included in the module, if applicable:	Not applicable
Semester/term	I (even semester)/first year
Module coordinator(s):	Dr. Hasan Subekti, M.Pd.
Lecturer(s):	Dr. Hasan Subekti, S.Pd., M.Pd. Aris Rudi Purnomo, S.Si., M.Pd., M.Sc. Ernita Vika Aulia, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 80 total hours per semester ~ 3.18 ECTS**
Credit point:	2 *sks* (3.18 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Explain the features of computer software to support science teaching and learning; 2. Operate the computer software to prepare instrument for teaching and learning; and 3. Combine the use of computer software to support teaching and learning in science.
Content:	Students will study about various computer software such as Microsoft Office, Mendeley, Cmap, Photoshop, Corel Draw, and Google Apps.
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting.
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

Assessment Components	Percentage Contribution
Participation	20%
Assignment	30%
Mid-semester test	20%
Final semester test	30%
Total	**100%**

Learning Methods	student-centred approach, lecturing, group and class discussion, and presentation (structured activities)
Form of Media:	PowerPoint slides, student worksheets, video tutorials
Literature (primary references):	1. Madcoms. 2011. *Rumus dan Fungsi Microsoft Excel untuk Pemula*. Jakarta: Andi 2. _____. 2011. *Mahir Dalam 7 Hari Microsoft Powerpoint*. Jakarta: Andi 3. Tim EMS. 2014. *Mahir Microsoft Word untuk Pemula*. Jakarta: Elex Media Komputindo
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Keanekaragaman Mahluk Hidup* Biodiversity
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103065
Abbreviation, if applicable:	KMH
Courses included in the module, if applicable:	Not applicable
Semester/term	II/first year (freshmen)
Module coordinator(s):	Ahmad Qosyim, S.Si., M.Pd
Lecturer(s):	Dr. Hasan Subekti, M.Pd. Ahmad Qosyim, S.Si., M.Pd. Eny Susiawati, Ph.D. Dhita Ayu Permata Sari, S.Pd., M.Pd
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	General Biology (8420103023)
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Utilizing science and technology to communicate ideas and findings in the basic concepts of the Diversity of Living Things 2. Mastering basic scientific concepts about the specific characteristics of organisms (macro and micro) related to the classification principle according to Whittaker (1969) 3. Make strategic decisions based on data and information that has been done, both in practice and theory 4. Responsible for the task of compiling a performance report on the results of the experiment, related tasks **Sub-CLO:** 1. The concept of Biodiversity and Viruses 2. Monera: Prokaryotic Algae, Blue Algae (*Cyanocloronta*) and Bacteria 3. Protists: Green Algae (Chlorophyta), Eukaryotic Algae (Brown, Golden and Red algae) 4. *Mycota*/Fungi (Mushrooms) 5. Plantae: Moss (Liverworts, Leaves and Horns)

<table>
<tr><td></td><td>6. Plantae: nails (Pterydophyta)
7. Plantae: Gymosperm, Angiosperms (Dicotyl, Monocot)
8. Animalia: Invertebrates (Mollusca, Worms, Arthropods, Echinoderms,
9. Animalia: Vertebrates (Fish, Amphibians, Reptiles, Aves, Mammals)</td></tr>
<tr><td>Content:</td><td>This course discusses the life of microorganisms, for example prions, viruses, Monera (, blue algae and bacteria) and macros, for example fungi, plants and animals, and their diversity, including classification principles, and representative examples in Indonesia, presented in theoretical form. and practice.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

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<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Constructivism, student-centered approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets,</td></tr>
<tr><td>Literature (primary references):</td><td>1. Brock, M. 1991.Biology of Microorganisme. New Jersey: Prentice-Hall
2. Campbell, N. A. et al. 2008. Biology; Eighth Edition. San Fransisco: Pearson, Benjamin Cummings.
3. Deacon, Jim W. 2006.Fungal Biology. Printed and bound in the United Kingdom. by Blackwell Science Ltd a Black Well Publishing Company.
4. Henry, Robert J. Plant Diversity and Evolution. Printed and bound in the UK by Cromwell Press, Trowbridge. CABI Publishing CAB International Wallingford Oxford shire OX10 8DE UK
5. Hickman Jr., Cleveland. P., Roberts, Larry S., Larson, Alan. 2001. Integrated Principles of Zoology, Eleventh Edition. 1221 Avenue of The American, New York. By the McGraw-Hill Companies, Inc.</td></tr>
<tr><td>Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research,</td></tr>
</table>

	Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

SEMESTER III

Module Name:	History and Philosophy of Science Education *Sejarah dan Filsafat Pendidikan IPA*
Module Level:	Bachelor Degree/Undergraduate Program
Course Code:	8420103067
Abbreviation, if applicable:	SFPI
Sub-heading, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	III/second year (sophomore)
Module coordinator(s):	Ahmad Qosyim, S.Si., M.Pd.
Lecturer(s):	Prof. Dr. Erman, M.Pd. Ahmad Qosyim, S.Si., M.Pd. Guntur Tri Mulyono, S.Si., M.Si.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory Course / ~~Elective Studies~~
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 3.18 ECTS**
Credit point:	2 *sks* (3.18 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLO):** After taking this course, university students have ability to; 1. Using ICT to explore the science philosophers' ideas in Greek, Dark age, renaissance, and modern philosopher and their application in science educational research 2. Apply scientific demarcation area to differentiate science, pseudo-science and religion 3. Explain history and principles of scientific method, falsification, including their application in science education 4. Explain the difference of realism and antirealism ideas in science educational context **Sub-CLOs:** 1. Describe the development of the philosophy of science that underlies the development of science: Definition and characteristics of science philosophy, Distinguishing knowledge, sciences and science, Distinguishing the

<table>
<tr><td></td><td>domains of metaphysics, philosophy and scientific method, Distinguishing science, pseudoscience and religion and to describe the application scientific demarcation area to differentiate science, pseudo-science and religion;
2. Distinguishing views / thoughts / focus of studies on science philosophy schools from ancient Greece to modern times, through search the literature from various sources / ICT for science philosophers' ideas in Greek, Dark age, renaissance, and modern philosopher;
3. Explain the basic principles of science justification up to the discovery of the scientific method in overcoming debates / problems and making decisions about science.
4. Distinguishing views of realism and anti-realism, as well as the principle of underdetermination in the development of science; and
5. Students can critically analyze the implementation and role of several philosophical views in science education to support their professional duties as a science teacher.</td></tr>
<tr><td>Content:</td><td>Assessing philosophy in the context of science and learning through critical analysis of the thought process and discovery of science products by natural science philosophers / scientists, including their justification from various learning sources / media that have developed from time to time and their application in the context of science education, based on the viewpoint of educational philosophy through critical analysis of education and science learning problems / issues / policies so as to produce logical solutions and make decisions appropriately and responsibly.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table>
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<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Constructivism, student-centred approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, and worksheets</td></tr>
<tr><td>Literature (main references):</td><td>1. Thomas J. Hickey, 2011, Introduction to phisophy of science. NewYork: Springer
2. Craigh Dilworth, 2006, The methaphysics of science:</td></tr>
</table>

	Boston studies in the philosophy of science, Netherland: Springer. 3. Cornel M. Hamm, 2005, Philosophycal Issues in Education: An introduction, London: Routledge. 4. James Ladyman, 2002, Understanding philosophy of science, London and New York: Roudledge 5. Anna Poedjiadi, 2001, Filsafat Ilmu Kependidikan, Bandung 6. Wilburg Applebaum, 2005, The scientific revolution and the foundation of modern science, London: Greenwood Press 7. Referensi lain yang relevan
Notes:	*__1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)__ according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	**__1 sks = 1,59 ECTS__

Module Name:	*Telaah Kurikulum Sekolah* (Curriculum Review)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103154
Abbreviation, if applicable:	Not applicable
Courses included in the module, if applicable:	Not applicable
Semester/term	III/Second Year (sophomore)
Module coordinator(s):	Dr. Elok Sudibyo, M.Pd.
Lecturer(s):	Dr. Elok Sudibyo, M.Pd. Aris Rudi Purnomo, S.Si., M.Pd., M.Sc. Wahyu Budi Sabtiawan, S.Si., M.Pd., M.Sc.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	General Biology (8420103023) General Physics (8420103045) General Chemistry (8420103074) Learning Theory (8420103155) Introductory of Education Educational Psychology
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. explain information regarding the rules, implementation, and issues related to Curriculum 2013; 2. analyze the components of Curriculum 2013; 3. analyze the scope of materials of basic competencies; and 4. design student worksheet related to basic competencies of Curriculum 2013.
Content:	Framework of Curriculum 2013, semester and year learning program, learning outcomes, student worksheet design, and concept-mapping.
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting.
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

	<table><tr><th>Assessment Components</th><th>Percentage Contribution</th></tr><tr><td>Participation</td><td>20%</td></tr><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table>
Learning Methods	student-centred approach, lecturing, group and class discussion, and presentation (structured activities), and flip learning
Form of Media:	PowerPoint slides, student worksheets, videos and book chapters.
Literature (primary references):	1. Krathwohl D R and Anderson L W 2001 *A Taxonomy for Learning Teaching and Assessing: A Revision of Bloom`s Taxonomy of Educational Objectives* (USA: Longman) 2. Morrison G R, Ross S M, Kalman H K, Kemp J E 2013 *Designing Effective Instruction* (USA: Wiley) 3. Ornestein A C and Hunkins F P 2018 *Curriculum: Foundation, Principles, and Issues* (Vivar, Malaysia: Pearson) 4. Badan Standar Nasional Pendidikan 2013 *Permendikbud Tentang Kurikulum Tahun 2013* (Jakarta: Depdikbud)
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018. ****1 sks = 1,59 ECTS**

Module Name:	Kewirausahaan (*Enterpreneur*)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	
Abbreviation, if applicable:	KWU
Courses included in the module, if applicable:	Not applicable
Semester/term	III/second year (junior)
Module coordinator(s):	Siti Nurul Hidayati, S.Pd., M.Pd.
Lecturer(s):	Siti Nurul Hidayati, S.Pd., M.Pd. Laily rosdiana, S.Pd., M.Pd. An Nuril Maulida Fauziah, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 15 weeks per semester, 90 total hours per semester ~ 3.18 ECTS**
Credit point:	2 *sks* (3.18 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** 1. Able to take advantage of IPTEK and master theoretical concepts in the field of entrepreneurship in an effort to develop a deep entrepreneurial spirit and formulate it in procedural problem solving 2. Able to make informed decisions and data analysis and provide direction in choosing alternative solutions 3. Responsible for informing the results of analysis of information and data, both orally and in writing
Content:	Understanding the concept of entrepreneurship in an effort to develop an entrepreneurial spirit, namely the ability to motivate oneself to be able to perceive business opportunities, create services, production, marketing, partnerships and management, and be able to improve problem-solving skills in business.
Attribute Soft skill:	Team work, Good scientist, Long life education
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

Assessment Components	Percentage Contribution
Participation	20%
Assignment	30%

	<table><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table>
Learning Methods	Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities), and flip learning
Form of Media:	LCD, PowerPoint, hand out, e-learning
Literature (primary references):	1. Stephen R Covey, 1997. The 7 habits of highly effective people (Indonesian edition) . Bina Rupa script 2. Robert T Kyiuosaki. 2004. Rich dad, poor dad . PT SUN Jakarta 3. Hendro. MM 2011. Entrepreneurship Basics . Erlangga 4. Alexander Osterwalder. 2012. Business Model generation . Gramedia compass
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Ilmu Sosial dan Budaya Dasar* (Basics Social and Cultural Sciences)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420102060
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	III/second year (sophomore)
Module coordinator(s):	Pambudi Handoyo, S.Sos., M.A.
Lecturer(s):	Pambudi Handoyo, S.Sos., M.A.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Master theoretical concepts about diversity and equality and human beings, and be able to formulate procedural solutions to various social and cultural problems.; 2. Obtain, collect, and process various social and cultural facts in order to solve various social and cultural problemsand; 3. Take strategic decisions based on analysis of information and data, and provide guidance in choosing various alternative solutions in solving and solving various social and cultural problems; 4. Demonstrate religion values and cultures as well as academics etiquette in doing professional task; and 5. Demonstrate religion values and cultures as well as academics etiquette in doing professional task.
Content:	Understanding of cultures, its history and values as well as show understanding on the danger of globalization and the alternatives ways in solving cultural problems
Attribute Soft skill:	Collaboration, communication, and argumentation in the natural classroom setting.
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

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<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Discussion, presentation (structured activities), and lecturing</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, whiteboard, and virtual learning platform</td></tr>
<tr><td>Literature (primary references):</td><td>1. Herimanto. 2013. Ilmu Sosial dan Budaya Dasar. Jakarta: Bumi Aksara.
2. Arifin, Zainal. 2012. Ilmu Sosia, Budaya Dasar. Makassar: Anugrah Mandiri.
3. Hartono. 1997. Ilmu Sosial Dasar. Jakarta: Bumi Aksara.
4. Umanggor, Rusmin, dkk. 2008. Ilmu Sosial & Budaya Dasar. Jakarta: Kencana Pernada.
5. Urbanus Ura Weruin, 2014. Manusia, Kebudayaan, dan Masyarakat, Jakarta: Pustaka Mandiri,(UUW-1).
6. Urbanus Ura Weruin, 2015. Visi Baru tentang Kebudayaan, Jakarta: Pustaka Mandiri.
7. Elly M. Setiadi, 2009. Ilmu Sosial Budaya Dasar. Jakarta: Kencana.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Anatomi dan Fisiologi Tumbuhan* (Plant Anatomy and Physiology)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103162
Abbreviation, if applicable:	Anfistum
Courses included in the module, if applicable:	Not applicable
Semester/term	III/second year (sophomore)
Module coordinator(s):	Enny Susiyawati, S.Si., M.Sc., M.Pd., Ph.D
Lecturer(s):	Dr. Rinie Pratiwi Puspitawati, M.Si. Enny Susiyawati, S.Si., M.Sc., M.Pd., Ph.D. Aris Rudi Purnomo, S.Si., M.Sc., M.Pd. Dhita Ayu Permata Sari, S.Pd., M.Pd. Wahyu Budi Sabtiawan, S.Si., M.Sc., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	General Biology (8420103023) General Chemistry (8420103074)
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. explain phenomena and processes in plant anatomy and physiology using biology and chemistry concepts. 2. Apply principles/Laws/Theories to various phenomena in plat anatomy and physiology. 3. Apply substantive concepts (principles/laws/ theories) in the field of plant anatomy and physiology in solving relevant problems. 4. Design and conduct research about plant anatomy and physiology.
Content:	Anatomy and physiology of root, stem, and leaf; diffusion and osmosis; translocation; transpiration; photosynthesis; plant respiration; and plant hormones.
Attribute Soft skill:	Discipline, collaboration, responsibility, and critical thinking.
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

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<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Constructivist, student-centre approach, research-based learning, lecturing, discussion, and presentation.</td></tr>
<tr><td>Form of Media:</td><td>White Board, LCD projector, Laptop, electric microscopes, internet, power point slides, and worksheet.</td></tr>
<tr><td>Literature (primary references):</td><td>1. Beck, Charles B. 2010. An Introduction to Plant Structure and Development: Plant Anatomy for the Twenty-First Century, 2 Edition Book. New York: Cambridge University Press.
2. Adam, Jennifer W. Mac, 2008. Structure and Function of Plants. New Delhi: Willey Blackwell.
3. Taiz, L. and Zeiger E. 2010. Plant Physiology, Fifth Edition. Sinauer Associates. California: Sunderland.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Biomekanika* (Biomechanics)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103053
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	III/Second year (Freshmen)
Module coordinator(s):	Dr. Elok Sudibyo, M.Pd.
Lecturer(s):	Dr. Elok Sudibyo, M.Pd. Dra. Martini, M.Pd. Dhita Ayu Permata Sari, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	– General Physics (Code: 8420103045) – General Chemistry (Code: 8420103074) – General Biology (Code: 8420103023)
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Apply basic science basic knowledge of physics, chemistry, and biology to describe phenomena and process of movement in living things by utilizing relevant ICTs; 2. Communicate ideas and research result related to movement in living things both orally or in writing; 3. Demonstrate decision making skills during laboratory activity.
Content:	Kinetics, kinematics, plant movement, human/animal movement.
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

Assessment Components	Percentage Contribution
Participation	20%
Assignment	30%

	<table><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table>
Learning Methods	Constructivism, student-centered approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning
Form of Media:	LCD, PowerPoint slides, and worksheets.
Literature (primary references):	1. Hamill, J. & Knutzen, K. M. 2015.*Biomechanical Basis of Human Movement.Second Edition.* Philadelphia: Lippincott Williams & Wilkins. 2. Giancoli, Douglas C. 2016. *Physics: Principles with Applications 7th Edition.* Boston: Pearson. 3. Beck, Charles B. 2010. *An Introduction to Plant Structure and Development: Plant Anatomy for the Twenty-First Century, 2 Edition Book*. New York: Cambridge University Press. 4. Trefil, J. and Hazen, R.M., 2016. *The Sciences: An Integrated Approach*. Wiley Global Education. 5. Reece, J. B., Urry, L. A., Cain, M. L., Wasserman, S. A., Minorsky, P. V., & Jackson, R. B. (2014). *Campbell biology* (No. s 1309). Boston, MA: Pearson. 6. Taiz, L. and Zeiger E. 2010*. Plant Physiology, Fifth Edition*. Sinauer Associates. California: Sunderland
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Zat dan Energy* (Matter and Energy)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103158
Abbreviation, if applicable:	ZE
Courses included in the module, if applicable:	Not applicable
Semester/term	III/second year (sophomore)
Module coordinator(s):	Tutut Nurita, S.Pd., M.Pd.
Lecturer(s):	Tutut Nurita, S.Pd., M.Pd. Muhamad Arif Mahdiannur, S.Pd., M.Pd. Ernita Vika Aulia, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Ability to make a decision based on information and data analysis and able to give direction and to choose alternative solutions; 2. Ability to mastery the theoretical concepts of matter and energy and able to formulate it to solve problem procedurally; 3. Ability to utilize science and technology instruments in the field of matter and energy and ability to adapt toward current facing problem related to solving a problem; 4. Ability to identify the state of matter (solid, liquid, and gas), analyze phase diagram (phases of matter and transitions), analyze the state of matter change process, describe temperature and heat, and identify form of energy that happens in everyday life; 5. Ability to identify and to analyze the expansion of matter, describe the thermodynamics concepts and analyses it in everyday life phenomena, describe mechanical energy due to conservation of energy, solve a problem that related to the conservation of mechanical energy, describe the conservation law in

<table>
<tr><td></td><td>energy and its application on simple machine's mechanical advantages;
6. Ability to demonstrate responsibility in their conduct and behavior in the classroom and scientific investigation, especially on delivering the information.</td></tr>
<tr><td>Content:</td><td>State of matter; Phases diagram (phases of matter and transitions); Temperature and heat; Form of energy; History of energy concept; Conservation of energy; Mechanical energy; Simple machine; and Thermodynamics.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table><tr><th>Assessment Components</th><th>Percentage Contribution</th></tr><tr><td>Participation</td><td>20%</td></tr><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table></td></tr>
<tr><td>Learning Methods</td><td>Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint, hand out, simulation, and e-learning Vinesa (https://vinesa.unesa.ac.id/course/view.php?id=374)</td></tr>
<tr><td>Literature (primary references):</td><td>1. National Research Council. (2004). Advanced Energetic Materials. National Academies Press.
2. National Research Council. (2004). Materials count: The Case for Material Flows Analysis. National Academies Press.
3. Horton, P., McCarthy, T., Werwa, E., & Zike, D. (2005). Physical Science: K. The Nature of Matter. Glencoe/McGraw-Hill.
4. Silberberg, M. (2018). Chemistry: The Molecular Nature of Matter and Change with Advanced Topics. McGraw-Hill.
5. Giambattista, A., McCarthy Richardson, B., & Richardson, R. C. (2010). Physics (2nd ed.). McGraw-Hill.
6. Moran, M. J., Shapiro, H. N., Boettner, D. D., & Bailey, M. B. (2011). Fundamentals of Engineering Thermodynamics (7th ed.). John Wiley & Sons.</td></tr>
<tr><td>Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year</td></tr>
</table>

	2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Pengelolaan Laboratorium dan Keselamatan Kerja* (Laboratory and Work Management and Safety)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103158
Abbreviation, if applicable:	Penglab
Courses included in the module, if applicable:	Not applicable
Semester/term	III/third year (junior)
Module coordinator(s):	Siti Nurul Hidayati, S.Pd., M.Pd.
Lecturer(s):	Siti Nurul Hidayati, S.Pd., M.Pd. Laily Rosdiana, S.Pd., M.Pd. Dr. Hasan Subekti, M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	General Physics (8420103045) General Chemistry (8420103074) General Biology (8420103023)
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Analyzing about how to use laboratory tools and managerial functions inthe laboratory; 2. Plan procedurally the construction of practical rooms in scool laboratories and their distribution; 3. Analyzing manage procedurally the implementation of pactum in school laboratories in accordance with cognitive, affective and psycomotor aspects as well as work safety; and 4. Procedurally evaluate the implementation of practicum in a laboratory based on SOP that have been made
Content:	Laboratory management and administration, work planning and costs, laboatory safety and safety, making solutions, evaluating laboratory work, and developing SOP
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

	<table><tr><th>Assessment Components</th><th>Percentage Contribution</th></tr><tr><td>Participation</td><td>20%</td></tr><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table>
Learning Methods	Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities), and flip learning
Form of Media:	LCD, PowerPoint, hand out, simulation, and whiteboard and e-learning unesa (https://vinesa.unesa.ac.id/course/view.php?id=423)
Literature (primary references):	1. Bettelheim &Landesberg.2000. Laboratory Experiment for Genearal, Organics, and Biochemistry Laboratory Handbook for Teacher 2. Sri Hidayati S, 2001. Penyediaan Alat dan Bahan Praktikum. Makalah Pelatihan teknisi Laboratorium Kimia/Biologi Madrasah Allah se-jawa Timur di Madiun 3. Supriono, Sri Hidayat dan Isnawati, 2011. Pelatihan atau Pembinaan Laboran Sekolah Jatim. Handout, tidak diterbitkan
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018. ****1 sks = 1,59 ECTS**

SEMESTER IV

Module Name:	*Pembelajaran Inovatif 1* (Innovative Learning 1)
Module Level:	Bachelor Degree/Undergraduate Program
Course Code:	8420103107
Abbreviation, if applicable:	PI 1
Sub-heading, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	IV/second year (sophomore)
Module coordinator(s):	Tutut Nurita, S.Pd., M.Pd.
Lecturer(s):	Prof. Dr. Erman., M.Pd. Laily Rosdiana, S.Pd., M.Pd. An Nuril MF, S.Pd., M.Pd. Enny Susiyawati, Ph.D
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory Course / ~~Elective Studies~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 3.97 ECTS**
Credit point:	3 *sks* (3.97 ECTS)
Requirements:	– Educational Psychology (8420102183) – Introductory of Natural Science (8420102028) – Learning Theory (8420103155) – History and Philosophy of Science Education (8420102159) – Management and Safety Work in Laboratory (8420103161)
Learning goals/competencies:	**Course Learning Outcomes (CLO):** After taking this course, university students have ability to; 1. Apply knowledge about the characteristics of innovative learning models 1 2. Apply pedagogical knowledge in designing, implementing, and evaluating integrated science learning 3. Designing, implementing and evaluating learning by utilizing ICT to support the implementation of innovative learning 1 **Sub-CLOs:** 1. Apply knowledge about the characteristics of learning models including concept acquisition, meaningful verbal learning, direct instruction, discussion, SET;

<table>
<tr><td></td><td>2. Planning, implementing and evaluating learning by utilizing ICT to support the implementation of innovative learning including Concept Acquisition Learning Models, Meaningful Verbal Learning, Direct Instruction, discussions, SET (Science Environment and Technology) and strategies to achieve student competence;
3. Implementing learning management using relevant learning models (Concept Acquisition Learning Model, Meaningful Verbal Learning, Direct Instruction, discussion, SET) according to the learning styles of students;
4. Make decisions in designing and using laboratory equipment, learning resources, and science and technology-based learning media and contexts to support the implementation of innovative learning including Concept Acquisition Learning Models, Meaningful Verbal Learning, Direct Instruction Learning, discussions, SET according to competence, characteristics of the subject matter, and characteristics of students</td></tr>
<tr><td>Content:</td><td>Acquisition of concepts, meaningful verbal learning, direct instruction, discussion, SET, learning management</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

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<tr><td>Participation</td><td>20%</td></tr>
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<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Constructivism, student-centered approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets, simulation, and e-learning Vinesa</td></tr>
<tr><td>Literature (main references):</td><td>1. Arends, Richard I.2012. Learning To Teach sixth Edition. New York: McGraw-Hill Book Company
2. Arends, Richard I. 2004.Guide to Field Experiences and Portofolio Development: to accompany ;learning to teach. New York: McGraw-Hill Book Company.
3. Ibrahim, Muslimin, Rachmadiarti, Fida, Ismono. 2005.Pembelajaran Kooperatif.Surabaya: Pusat Sains dan Matematika Sekolah.
4. Ibrahim, Muslimin.2012. Konsep, Miskonsepsi, dan Cara Pembelajarannya. Surabaya: University Press</td></tr>
</table>

	5. Nur, Mohamad. 2000. Strategi-strategi Belajar. Surabaya: Pusat Sains dan Matematika Sekolah 6. Nur, Mohamad, Kardi Soeparman. Pembelajaran langsung. Surabaya: Pusat Sains dan Matematika Sekolah
Notes:	*__1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)__ according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	**__1 sks = 1,59 ECTS__

Module Name:	*Anatomi dan Fisiologi Hewan* (Animal Anatomy and Physiology)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103167
Abbreviation, if applicable:	Not applicable
Courses included in the module, if applicable:	Not applicable
Semester/term	IV/Second Year (sophomore)
Module coordinator(s):	Dr. Nur Ducha, M.Si.
Lecturer(s):	Dr. Nur Ducha, M.Si. Enny Susiyawati, Ph.D. Aris Rudi Purnomo, S.Si., M.Pd., M.Sc. Dhita Ayu Permata Sari, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	General Biology (8420103023) General Chemistry (8420103074) General Physics (8420103045)
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Describe anatomical and physiological network among different system in animal and human body 2. Explain the phenomena related to animal anatomy and physiology using ICT 3. Demonstrate decision making skills during laboratory activity
Content:	The systems in animal and human body, namely, cardiovascular system, respiratory system, skeletal and muscular system, nervous system, digestive system, osmoregulatory system, endocrine system, reproductive system, and embryology
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting.
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

Assessment Components	Percentage Contribution
Participation	20%

	<table><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table>
Learning Methods	student-centred approach, lecturing, group and class discussion, lab work investigation, and presentation (structured activities), and flip learning
Form of Media:	PowerPoint slides, student worksheets, videos, virtual laboratory, and preserved organs
Literature (primary references):	1. Kardong, K. V. (2012). *Vertebrates: Comparative Anatomy, Function, and Evolution*. New York: McGraw-Hill. 2. Knobbil & Neill's. (2015). *Physiology of Reproduction*. 4th Edition. Plant & Zeleznik (Eds). Oxford: Elsevier. 3. Kay, I. (1998). *Introduction to Animal Physiology*. Manchester: Bios Scientific Publisher. 4. Sherwood, Klandorf, & Yancey. (2013). *Animal Physiology: from Genes to Organisms*. Belmont, USA: Brooks/Cole. 5. Tortora & Derrickson. (2012). *Principles of Anatomy and Physiology*. 13th Edition. USA: John Wiley & Sons, Inc. 6. Hill, Wyse, & Anderson. (2012). *Animal Physiology*. 3rd Edition. Massachusetts: Sinauer Associate Inc. 7. Gilbert, S. F. (2010). *Developmental Biology*. 9th Edition. Massachusetts: Sinauer Associate Inc. 8. Ellie, J. (2011). *Visualizing Human Biology*: *Lab Manual*. USA: John Wiley & Sons, Inc. 9. Treuting & Dintzis (Eds). (2012). *Comparative Anatomy and Histology: A Mouse and Human Atlas*. San Francisco: Elsevier. 10. Rappole, J. H. (2013). *The Avian Migrant: The Biology of Bird Migration*. New York: Columbia University Press. 11. Wood & Kellermann (Eds). (2015). *Phenological Synchrony and Bird Migration: Changing Climate and Seasonal Resources in North America*. London: CRC Press. 12. Ladich (Ed). (2015). *Sound Communication in Fishes*. Dordrecht: Springer.
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Fluida* (Fluid)
Module Level:	Bachelor Degree/Undergraduate Program
Course Code:	8420103048
Abbreviation, if applicable:	Fluid
Sub-heading, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	IV/second year (sophomore)
Module coordinator(s):	Tutut Nurita, S.Pd., M.Pd.
Lecturer(s):	Tutut Nurita S.Pd., M.Pd. Muhamad Arif Mahdiannur, S.Pd., M.Pd. Enny Susiyawati, Ph.D
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory Course / ~~Elective Studies~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 3.97 ECTS**
Credit point:	3 *sks* (3.97 ECTS)
Requirements:	– General Physics (8420103045) – General Chemistry (8420103074) – General Biology (8420103023)
Learning goals/competencies:	**Course Learning Outcomes (CLO):** After taking this course, university students have ability to; 1. Describes the concepts and principles / laws of fluids (static, dynamic, and ideal gases); 2. Formalize procedural problem solving in fluid 3. Solve problems related to fluids and their applications in everyday life **Sub-CLOs:** 1. Explain the concepts of static fluids, dynamic fluids and ideal gases and their application in everyday life as part of the development of science and technology with the assignment to solve problems in the field of science; 2. Analyzing by solving problems procedurally the principles / laws of fluids (static, dynamic, and ideal gases) include: write down the objectives of the experiment, write down the background, formulate problems, determine hypotheses, write down experimental data, analyze experimental data by

<table>
<tr><td></td><td>connecting with the concept of fluid, conclude the results of the experiment;
3. Analyze information, data in fluid practicum and can make reports correctly</td></tr>
<tr><td>Content:</td><td>Definition of fluids, properties of fluids, pressure on solid and fluid objects, principles / laws of static fluids, specific properties of liquids, principles / laws of dynamic fluids, typical properties of gaseous fluids, and solving problems applications in the field of science such as blood pressure, diffusion in the event of respiration, osmotic pressure.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Constructivism, student-centered approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets, and e-learning Vinesa</td></tr>
<tr><td>Literature (main references):</td><td>1. Bansal, R.K.2008.A Textbook of Fluid Mechanics.Delhi : Ajit Printers, Old Maujpur.
2. Bruce, dkk. 2003. Mekanika Fluida Jilid 1 Edisi Keempat. Jakarta: Erlangga.
3. Currie, I.G. 2012.Fundamental Mechanics of Fluids, Fourth Edition. USA: CRC Press
4. Giancoli, Douglas. 2010. Fisika I. Jakarta: Erlangga.
5. Giordano, Nicholas J. 2010. College Physics: Reasoning and Relationships, First Edition. Canada: Nelson Education, Ltd..</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Konservasi Sumber Daya Alam dan Lingkungan* Conservation of Natural Resources and Environment
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420102078
Abbreviation, if applicable:	KSDAL
Courses included in the module, if applicable:	Not applicable
Semester/term	IV
Module coordinator(s):	Ahmad Qpsyim, S.Si.M.Pd
Lecturer(s):	Dra. Wisanti, M.S. Dr. Sunu Kuntjoro, M.Si. Ahmad Qosyim, S.Si., M.Pd
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 50 minutes lectures, 3 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 3.18 ECTS**
Credit point:	2 *sks* (3.18 ECTS)
Requirements:	General Biology KMH
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Have mastery of conservation principles, natural resources, and the environment 2. Mastering the concept of KSDAL application and relevant technology in the management of natural resources and the environment 3. Able to solve problems in the community in an effort to apply knowledge of KSDAL 4. Able to realize independent character, and care for the environment through KSDAL lectures to develop ecopreneurship Sub CLO 1. Propose creative ideas in solving environmental problems in general, by understanding the scope of conservation which includes: background, definition, goals, benefits and efforts to conserve natural resources and the environment (SDAL) 2. Propose creative ideas in solving environmental problems in general, by understanding efforts to conserve natural resources and the environment (SDAL)

	3. Applying the principles of environmental ethics in life, by understanding environmental ethics which include: Definition, Paradigm, and Environmental Ethical Principles. 4. Develop ideas that are effective in overcoming natural resources and environmental problems. 5. Developing systematic ideas to preserve local wisdom of the community 6. Develop ideas that are effective in accordance with the principles of natural resource management and the environment 7. Understand the principles of conservation globally and locally. 8. Take an active role in the Unesa eco campus movement 9. Take an active role in efforts to overcome the environment in the area of origin through conservation activities. 1. Mengusulkan gagasan kreatif dalam memecahkan masalah lingkungan secara umum, dg memahami Ruang lingkup konservasi yang meliputi: Latar belakang, Pengertian, tujuan, manfaat dan upaya-upaya konservasi sumber daya alam dan lingkungan (SDAL) 2. Mengusulkan gagasan kreatif dalam memecahkan masalah lingkungan secara umum, dengan memahami Upaya-upaya konservasi sumber daya alam dan lingkungan (SDAL) 3. Menerapkan prinsip-prinsip etika lingkungan dalam kehidupan, dengan memahami Etika lingkungan yang meliputi: Pengertian, Paradigma, dan Prinsip-prinsip Etika Lingkungan. 4. Mengembang-kan gagasan yang efektif untuk mengatasi permasalahan SDA dan lingkungan. 5. Mengembang-kan gagasan yang sistematis untuk melestarikan kearifan lokal masyarakat 6. Mengembang-kan gagasan yang efektif sesuai dengan prinsip pengelolaan SDA dan lingkungan 7. Memahami prinsip-prinsip konservasi secara global dan lokal. 8. Berperan aktif dalam gerakan *eco campus* Unesa 9. Berperan aktif dalam usaha mengatasi lingkungan di daerah asal melalui kegiatan konservasi.
Content:	Discusses: 1) The scope of conservation which includes: Definition, objectives, benefits and efforts to conserve natural resources and the environment (SDAL); 2) Environmental ethics which includes: Definition, Paradigm, and Environmental Ethical Principles; 3) Natural resources which include: Definition, types and benefits of Natural Resources; 4) Local wisdom which includes: Definition, approach, challenges and local wisdom in people's lives in

<table>
<tr><td></td><td>the future; 5) Management and problems of natural resources and the environment which include: issues, problems and management of natural resources and the environment; 6) Awareness of conservation which includes awareness of the importance of conserving natural resources and the environment, an eco campus and a conservation campus. Lecture activities are carried out in a student center with discussions, observations, project assignments, and presentations by developing ecopreneurship characteristics.

Membahas tentang: 1) Ruang lingkup konservasi yang meliputi: Pengertian, tujuan, manfaat dan upaya-upaya konservasi sumber daya alam dan lingkungan (SDAL); 2) Etika lingkungan yang meliputi: Pengertian, Paradigma, dan Prinsip-prinsip Etika Lingkungan; 3) Sumber daya alam yang meliputi: Pengertian, jenis-jenis dan manfaat Sumber Daya Alam; 4) Kearifan lokal yang meliputi: Pengertian, pendekatan, tantangan dan kearifan lokal dalam kehidupan masyarakat di masa yang akan datang; 5) Pengelolaan dan permasalahan sumber daya alam dan lingkungan yang meliputi: isu-isu, permasalahan dan pengelolaan sumber daya alam dan lingkungan; 6) Sadar konservasi yang meliputi, kesadaran pentingnya konservasi sumber daya alam dan lingkungan, eco campus dan kampus konservasi. Kegiatan perkuliahan dilakukan secara student center dengan diskusi, observasi, tugas proyek, dan presentasi dengan mengembangkan karakteristik ecopreneurship.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Constructivism, student-centred approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets,</td></tr>
<tr><td>Literature (primary references):</td><td>1. Cluras, D. D. and Reganold, J.P. 2010. Natural Resources Conservation Future. Washington:</td></tr>
</table>

	Washington State University. 2. Hamzah, S. 2010. *Pendidikan Lingkungan. Sekelumit Wawasan Pengantar*. Bandung: PT RefikaAditama. 3. Indrawan, M; Primack, R.B; Supriatna, J. 2007. *Biologi Konservasi*. Jakarta: Yayasan Obor Indonesia. 4. Iskandar, Z.I. 2012. *Psikologi Lingkungan. Teori dan Konsep*. Bandung: PT Refika Aditama. 5. Keraf, A.S. 2010. *Etika Lingkungan Hidup*. Jakarta: Penerbit BukuKompas. 6. Marfai, M.A. 2013. *Pengantar Etika Lingkungan dan Karifan Lokal*. Yogyakarta: Gadjah Mada University Press. 7. Mitchell, B; Setiawan, B; Rahmi, D.H. *Pengelolaan Sumber daya dan Lingkungan. Yogyakarta*: Gadjah Mada University Press. 8. Suparmoko, M. 2013. *Ekonomi Sumber Daya Alam dan Lingkungan. Suatu Pendekatan Teoritis*. Yogyakarta: BPF. 9. Van Dyke, F. 1993. *Conservation Biology*. Boston: University of Arkansas, Inc.
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Dasar-dasar Biokimia* (Introduction to Biochemistry)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103163
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	IV/second year (sophomore)
Module coordinator(s):	Prof. Dr. Erman, M.Pd.
Lecturer(s):	Prof. Dr. Erman, M.Pd. Dra. Martini, M.Pd. Siti Nurul Hidayati, S.Pd., M.Pd. Wahyu Budi Sabtiawan, S.Si., M.Pd., M.Sc.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	– General Chemistry
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Utilizing science and technology to understand the role of nutrients as an energy source; 2. Mastering the structure, function, and biochemical reactions of nutrients; 3. Be able to write down ideas for preventing metabolic disorders.
Content:	Structure and function of carbohydrates, lipids and proteins; The chemical composition of the protoplasm; Energy metabolism; Carbohydrate metabolism; Lipid metabolism; and Protein metabolism.
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table>
<tr><td></td><td>
<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Problem-based learning, lecturing, discussion, and presentation (structured activities).</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets.</td></tr>
<tr><td>Literature (primary references):</td><td>1. Cambpbell. M.K. 1999.Biochemistry(3rd Ed). Harcourt College Publisher Foreworth.
2. Erman. 2007. Dasar-dasar Biokimia Olahraga. Surabaya: Unesa University Press.
3. Mathew. C.K. Van Holde. K.E.A.Hem, K.G. 2000.Biochemistry (3rd). San Fransisco: Longman Inc.
4. Stryer. L. 1996. Biokimia (ed 4). Jakarta: Penerbit Buku Kedokteran EGC.
5. Yohanes Ngili. 2010. Biokomia Dasar. Bandung: Rekayasa Sains.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Media Pembelajaran* Learning Media
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103090
Abbreviation, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	4/ second year (sophomore)
Module coordinator(s):	Hasan Subekti
Lecturer(s):	Hasan Subekti Wahyu Budi Sabtiawan Ernita Vika Aulia
Language:	Bahasa Indonesia (Indonesian language)
Classification within the curriculum:	Compulsory Course/ ~~Elective Studie~~s
Teaching format/class hours per week during the semester:	2 contact hours of lecturer (Indonesia credit semester or sks*)
Workload:	2 x 50 minutes lectures, 2 x 60 minute structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 79.34 total hours per semester ~ 2.64 ECTS**
Credit point:	2 sks (2.64 ECT)
Requirements:	- Learning Theory - The Foundation of Learning - Computer Basics
Learning goals/competencies:	**General Competencies (Knowledge):** Students can explain the definition, types/classifications, functions, fundamentals of media development, and can choose, design, and produce learning media by utilizing the surrounding environment (contextual) and ICT. **Specific Competence:** 1. Integrate ICT in science learning as a source and learning medium and use it to support the implementation of learning. 2. Mastering the understanding, types/classifications, functions, and basics of developing instructional media. 3. Designing, selecting and producing science learning media by utilizing the surrounding environment (contextual) and / or ICT-based. 4. Have a responsible attitude in developing science learning media that are practical, efficient and safe for students.
Content:	Introduction to learning media, development of simple science teaching aids models, instructional learning media (Power Point), shooting and editing movie, facebook learning media, website and webblog learning media,

<table>
<tr><td></td><td>animation media.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>University students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on following weight:
<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table></td></tr>
<tr><td>Learning Methods</td><td>Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint, hand out, simulation, e-learning Vinesa, and whiteboard</td></tr>
<tr><td>Literature:</td><td>1. Fenrich, Peter. 1997. Practical Guidelines For Creating Instructional: Multimedia Application. San Diego, USA: The Dryden Press.
2. Heinich, R., Molenda, M., Russell, J. D., & Smaldino, S. E. 1999. Instructional media and technologies for learning. Upper Saddle River, NJ: Prentice-Hall.
3. Isnawati, Supriono, dan Hasan Subekti. 2013. Rampai Media Pembelajaran Sains Inovatif. Surabaya: Jaudar Press.
4. Smadino, Sharon E., Debora L. Lowter, James D. Russell. 2011. Instructional Technology & media for Learning (Teknologi Pembelajaran dan Media untuk Belajar). Jakarta: Kencana Prenada Media Group.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Asesmen Proses dan Hasil Belajar* (Assessment and Evaluation)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103010
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	IV/second year (sophomore)
Module coordinator(s):	Dr. Elok Sudibyo, M.Pd.
Lecturer(s):	Beni Setiawan, S.Pd., M.Pd. Wahyu Budi Sabtiawan, S.Si., M.Pd., M.Sc. Dhita Ayu Permata Sari, S.Pd., M.Pd. Aris Rudi Purnomo, S.Si., M.Sc., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	Curiculum Review, Learning Theory, and Basic Computer
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Understand the concepts and principles of assessment process and learning outcomes including terminology and understanding, taxonomy of learning outcomes, assessment principles, assessment strategies and forms, development steps, assessment instrument quality criteria, item analysis, and interpretation of assessment results; and 2. Design instruments to assess the affective, cognitive, and psychomotor domain learning processes and outcomes that are adequate with learning indicators.
Content:	Principles and Theory of Assessment, Validity and Reliability, and Assessment Design
Attribute Soft skill:	Collaboration, communication, and argumentation in the natural classroom setting.
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

Assessment Components	Percentage Contribution
Participation	20%

<table>
<tr><td></td><td><table>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table></td></tr>
<tr><td>Learning Methods</td><td>Discussion, project-based learning, presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, and virtual learning platform</td></tr>
<tr><td>Literature (primary references):</td><td>1. MacMohan M, Simmons P, Sommers R, DeBaets D, and Crawley F. 2006. Assessment in Science: Practical Experiences and Education Research. USA: NSTA Press.
2. Brookhart, Susan M. 2010. How to assess higher-order thinking skills in your classroom. Alexandria: ASCD.
3. Pusat Analisis dan Sinkronisasi Kebijakan. 2018. Panduan Praktis Implementasi Penguatan Pendidikan Karakter (PKK) Berbasis Budaya Sekolah. Jakarta: PASKA.
4. Krathwohl, D.R., 2002. A revision of Bloom's taxonomy: An overview. Theory into practice, 41(4), pp.212-218.
5. Tim Pembelajaran dan Kurikulum Direktorat Pembinaan Sekolah Menengah Pertama. 2016. Modul Pengembangan Instrumen Penilaian oleh Pendidik Mata Pelajaran Ilmu Pengetahuan Alam Sekolah Menengah Pertama. Jakarta: Kemendikbud.
6. Direktorat Pembinaan Sekolah Menengah Pertama. 2017. Panduan Penilaian oleh Pendidik dan Satuan Pendidikan untuk Sekolah Menengah Pertama. Jakarta: Kemendikbud.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

SEMESTER V

Module Name:	*Pembelajaran Inovatif 2* (Innovative Learning 2)
Module Level:	Bachelor Degree/Undergraduate Program
Course Code:	8420103109
Abbreviation, if applicable:	PI 2
Sub-heading, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	V/third year (junior)
Module coordinator(s):	Tutut Nurita, S.Pd., M.Pd.
Lecturer(s):	Prof. Dr. Erman., M.Pd. Laily Rosdiana, S.Pd., M.Pd. An Nuril MF, S.Pd., M.Pd. Enny Susiyawati, Ph.D
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory Course / ~~Elective Studies~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 3.97 ECTS**
Credit point:	3 *sks* (3.97 ECTS)
Requirements:	– Innovative Learning 1(8420103107) – Learning Media (8420103090) – Assesment and Evaluation (8420103010)
Learning goals/competencies:	**Course Learning Outcomes (CLO):** After taking this course, university students have ability to; 1. Apply knowledge about the characteristics of innovative learning models 2 2. Apply pedagogical knowledge in designing, implementing, and evaluating integrated science learning 3. Designing, implementing and evaluating learning by utilizing ICT to support the implementation of innovative learning 2 **Sub-CLOs:** 1. Apply knowledge about the characteristics of learning models including cooperative learning, problem-based learning, inquiry learning, discovery learning, contextual learning and project-based learning; 2. Planning, implementing and evaluating learning by utilizing ICT to support the implementation of innovative learning including cooperative learning,

<table>
<tr><td></td><td>problem-based learning, inquiry learning, discovery learning, contextual learning and project-based learning and strategies to achieve student competence;
3. Implementing learning management using relevant cooperative learning, problem-based learning, inquiry learning, discovery learning, contextual learning and project-based learning according to the learning styles of students;
4. Make decisions in designing and using laboratory equipment, learning resources, and science and technology-based learning media and contexts to support the implementation of innovative learning including cooperative learning, problem-based learning, inquiry learning, discovery learning, contextual learning and project-based learning according to competence, characteristics of the subject matter, and characteristics of students</td></tr>
<tr><td>Content:</td><td>cooperative learning, problem-based learning, inquiry learning, discovery learning, contextual learning and project-based learning</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Constructivism, student-centered approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets, simulation, and e-learning Vinesa</td></tr>
<tr><td>Literature (main references):</td><td>1. Arends, Richard I.2012. Learning To Teach sixth Edition. New York: McGraw-Hill Book Company
2. Arends, Richard I. 2004.Guide to Field Experiences and Portofolio Development: to accompany ;learning to teach. New York: McGraw-Hill Book Company.
3. Ibrahim, Muslimin, Rachmadiarti, Fida, Ismono. 2005.Pembelajaran Kooperatif.Surabaya: Pusat Sains dan Matematika Sekolah.
4. Ibrahim, Muslimin.2012. Konsep, Miskonsepsi, dan Cara Pembelajarannya. Surabaya: University Press
5. Nur, Mohamad. 2000. Strategi-strategi Belajar. Surabaya: Pusat Sains dan Matematika Sekolah</td></tr>
</table>

Notes:	*__1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)__ according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	**__1 sks = 1,59 ECTS__

Module Name:	*Sains, Lingkungan, Teknologi, Masyarakat* (Science, Environment, Technology, and Society)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103138
Abbreviation, if applicable:	SETS
Courses included in the module, if applicable:	Not applicable
Semester/term	V/third year (junior)
Module coordinator(s):	Dra. Martini, M.Pd.
Lecturer(s):	Dra. Martini, M.Pd. Laily Rosdiana, S.Pd., M.Pd. Aris Rudi Purnomo, S.Si., M.Pd., M.Sc.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	– General Chemistry – General Physics – General Biology
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Identify issues related to environmental problems; 2. Mastering scientific concepts to choose solutions related to environmental problems; 3. Write environmental problems solving ideas in the form of a proposal; and 4. Work collaboratively to implement environmental problems solving ideal and write report.
Content:	The role of students in environmental management; waste management; technology that converts waste into alternative energy sources; plants producing biopesticide compounds; Ecological and economic benefits of using biopesticides; student innovative ideas in environmental management; designing innovative work of students in environmental management; student's innovative performance in environmental management.
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade

<table>
<tr><td></td><td>(NA) is calculated based on the following weight:

<table><tr><th>Assessment Components</th><th>Percentage Contribution</th></tr><tr><td>Participation</td><td>20%</td></tr><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table></td></tr>
<tr><td>Learning Methods</td><td>Project-based learning, lecturing, discussion, and presentation (structured activities).</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets, and e-learning Vinesa (https://vinesa.unesa.ac.id/course/view.php?id=171)</td></tr>
<tr><td>Literature (primary references):</td><td>1. Koul, O. & Dhaliwal, D. S (Ed). 2002. Microbial Biopesticides. New York: Taylor & Francis
2. Martini, dkk. 2018. Penumbuhan Budaya Akademik dalam Konteks Ecopreneurship. Surabaya: Unesa University Press.
3. Mousdale, D.M. 2008. Biofuels: Biotechnology, Chemistry, and Sustainable Development. New York: Taylor & Francis.
4. Ristek, 2012. 104 Inovasi Indonesia. Jakarta: Business Innovation Center (BIC)
5. William Linda D. 2005. Environmental Science. USA: Mc Graw Hill.
6. Winarsih, 2015. Peran Mahasiswa dalam Pembangunan Berkelanjutan. Kumpulan Handout.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Ekologi* Ecology
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103033
Abbreviation, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	V/third year (junior)
Module coordinator(s):	Ahmad Qosyim, S.Si., M.Pd
Lecturer(s):	Prof. Dr. Fida Rahmadiarti, M.Kes. Dra. Herlina Fitrihidajati, M.Si. Dr. Tarsan Purnomo, M.Si. Dr. Hasan Subekti, M.Pd. Ahmad Qosyim, S.Si., M.Pd
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	General Biology (8420103023)
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Mastering the basic concepts of Ecology science about the principles and concepts of ecosystems 2. Utilizing Information and communications technology (ICT) to communicate ideas, ideas and findings in Ecological concepts 3. Make strategic decisions based on the data and information that has been done, to apply the concepts of theory and practice 4. Able to work independently, work together in collaborative teams **Sub-CLO:** 1. Introduction: Scope of Ecology: Relationship of Ecology with other sciences, Division of Ecology, Units of living things in ecosystems 2. Principles and Concept of Ecosystem: Concept of ecosystem, concept of productivity 3. Principles and Concepts of Energy: Basic concepts of energy, Concept of productivity 4. The process of eating eating: food chains, food webs, relationships

<table>
<tr><td></td><td>of metabolism and individual size, trophic structures and ecological pyramids
5. Principles and Concepts of the biogeochemical cycle: Types and basic patterns of biogeochemistry, sediment cycle, organic nutrient cycle
6. Limiting Factors: Liebig's Minimum Law, Shelford's Law of Tolerance, Physical-Chemical Factors as Limiting factors, Ecological Indicators
7. Community: the concept of community, intra-community classification, diversity of species, patterns in the community, ecotone
8. Population growth, interaction and regulation: Basic concept of population, characteristics of population, population growth, basic concept of population rate, population interaction, environmental carrying capacity
9. Species and Individuals: Concept of species, Habitat, Ecological niche, Speciation and Adaptation
10. Eco-energetics and ecosystem development: Energy flows, dispersion, aggregation, isolation and territoriality, group selection, the concept of climax, ecosystem development
11. Biome: Terrestrial environment, vegetation, types of biomes
12. Conservation History</td></tr>
<tr><td>Content:</td><td>Understand, and communicate the basic concepts of Ecology regarding: understanding and application of the principles and concepts of individuals, populations, communities, ecosystems; vegetation: productivity, succession, environmental factors, biomes, tropical terrestrial vegetation; tolerance range, time-temperature concept, feeding-eating relationships, ecological niches, growth parameters, interaction and regulation, population interaction and regulation, and conservation. Presented in the form of theory and practice.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Constructivism, student-centered approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets,</td></tr>
<tr><td>Literature (primary references):</td><td>1. Campbell, N. A. et al. (2008). Biology; Eighth Edition. San Fransisco: Pearson, Benjamin Cummings.
2. Van der Maarel, Eddy. Ed. 2005. Vegetation Ecology. Printed and bound in the United Kingdom. by Blakwell Science Ltd a Black Well Publising Company.</td></tr>
</table>

	3. Myers, Judith H. and Bazely Dawn R. 2003. *Ecology and Control of Introduced Plants*. The Edinburgh Building, Cambrige CB2 2RU, United Kingdom. Cambridge Universty Press. 4. Mayhew, Peter J. 2006. *Discovering Evolutionary Ecology*. Published in the United States; by Oxford University Press Inc., New York. 5. Mackenzie, A. A.S. Bali & S.R. Virdee. 1998. *Instant Note In Ecology*. Singapore: Bios Scientific Publishers Ltd. 6. Spellerberg, lan,F. Longman. 1998. *Conservation Biology*. Singapore Publishers Ltd. 7. Gough, A. (2004). Achieving "Sustainability Education" in Primary Schools as a Result of the Victorian Science in Schools Research Project. *Australian Journal of Environmental Education, Vol. 20*(2). 8. Gough, A., & Sharpley, B. (2005). *Education for a sustainable future: A National Environmental Education Statement for Australia school.* Diambil dari http://www.environment.gov.au/education/publications/pubs/national-action -plan.pdf
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Larutan* (Solution)
Module Level:	Bachelor degree/Undergraduate Program
Course Code:	
Abbreviation, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	V/third year
Module coordinator(s):	Dr. Wahono Widodo, M.Si.
Lecturer(s):	Dr. Wahono Widodo, M.Si. SitiNurulHidayati, S.Pd., M.Pd. Wahyu Budi Sabtiawan, S.Si., M.Pd., M.Sc. Ernita Vika Aulia, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian)
Classification within the curriculum:	Compulsory Course / ~~Elective Studies~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 3.97 ECTS**
Credit point:	3 *sks* (3.97 ECTS)
Requirements:	
Learning goals/competencies:	**Course Learning Outcomes (CLO):** After taking this course, university students have ability to; 1. Apply the concept of solution, solution concentration, and colloid as the basis for solving problems in everyday life. 2. Apply the colligative nature of the solution and Raoult's law in order to solve relevant problems in everyday life 3. Apply the electrical properties of solutions in everyday life 4. Analyze acid-base, buffer solution, and hydrolysis in order to solve relevant problems in everyday life 5. Have responsible attitude in investigating / experimenting the properties of solutions 6. Willing to think critically in discussions and investigations / experiments on the properties of solutions
Content:	The concept of solution, solution concentration, colloid,colligative properties, acid-base, buffer, colligative,

<table>
<tr><td></td><td>and the electrical properties of the solution</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>University students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on following weight:
<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table></td></tr>
<tr><td>Learning Methods</td><td>Constructivism, student-centered approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets, laboratory equipments and substances, and e-learning Unesa: (https://vi-learn.unesa.ac.id/course/view.php?id=3590)</td></tr>
<tr><td>Literature (main references):</td><td>1. Atkins, S.P.W. 1995. Physical Chemistry. Oxford: ELBS Oxford University Press.
2. Barrow Gordon M. 1996.Physical Chemistry.Sixth edition. New York : Mc Graw-Hill.
3. HiskiaAchmad. 2001. Kimia Larutan. Bandung: Citra Aditya Bakti
4. Merril, 1995.Chemistry. New York Colombus Ohio California: Glencao Mc Graw Hill.
5. Soren Prip Beier & Peter Dybdallhede. 2010. Essential of Chemistry 2nd edition. Ventus Publishing.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity or independent learning (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**Total ECTS = (total hours workload)/ 30 hours
30 study hours = 1 ECTS credit point</td></tr>
</table>

Module Name:	Life at Cellular Level *Kehidupan Tingkat Sel*
Module Level:	Bachelor Degree/Undergraduate Program
Course Code:	8420103067
Abbreviation, if applicable:	KTS
Sub-heading, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	VII/fourth year (senior)
Module coordinator(s):	Ahmad Qosyim, S.Si., M.Pd.
Lecturer(s):	Prof. Dr. Erman, M.Pd. Ahmad Qosyim, S.Si., M.Pd. Guntur Tri Mulyono, S.Si., M.Si.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory Course / ~~Elective Studies~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	– General Biology (Code: 8420103023) – General Chemistry (Code: 8420103074) – Introduction to Biochemistry (Code: 8420103163)
Learning goals/competencies:	**Course Learning Outcomes (CLO):** After taking this course, university students have ability to; 1. **Using science and technology to explore data and information** (principles / laws / theories) to explain cells and the processes that occur in them and to solve problems related to life at the cellular level. 2. **Explain the concepts, principles, and cell theory, including**: structure and function of cells and cell organelles, structure and function of the plasma membrane, biological structure and function of proteins and nucleic acids, mechanisms of protein synthesis, cell growth and proliferation, materials and reactions chemistry that supports the role of function and supports the structure of cell organelles, as well as differentiation and determination used to formulate alternative solutions to relevant problems. 3. Make strategic decisions based on the analysis of information and data relating to life at the cellular level in the context of being a science teacher candidate. 4. Able to work independently, work together in

<table>
<tr><td></td><td>collaborative teams, show a responsible attitude for both individual and team assignments, and communicate ideas, opinions and arguments orally / in writing

Sub-CLOs:
1. Search the literature from various sources / ICT for cell concepts, principles, and theory
2. Describe the structure and function of cells and their organelles
3. Describe the structure and function of cells and their organelles
4. Identifying the factors that influence cell-level life in terms of components, structure, composition, biochemical processes and functions of each cell organelle either independently or in groups
5. Describe various disorders of cell function and their causes as well as efforts to overcome problems of life at the cellular level
6. Describe the process of protein synthesis, cell growth and proliferation and the factors that influence it
7. Describe the process of protein synthesis, cell growth and proliferation and the factors that influence it</td></tr>
<tr><td>Content:</td><td>The study of life at the cellular level includes the structure, function and biochemical processes in each cell organelle, including the biological function of proteins and nucleic acids, protein synthesis mechanisms, cell growth and proliferation, materials and chemical reactions that support the role, function, and structure. cell organelles and differentiation and determination which are carried out through theoretical studies and discussions.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

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<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
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<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Constructivism, student-centered approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets</td></tr>
<tr><td>Literature (main references):</td><td>1. Gatot, Suparno, Djoko Budiono, dan Sri Kencananingsih. 2014. Handout Kehidupan Tingkat Sel. Unesa.</td></tr>
</table>

	2. Karp, Gerald. 2010. *Cell Biology 6th Edition International Student Version*. Wiley & Sons. 3. Wong, EV. 2009. *Cells: Molecules and Mechanisms*. Louisville: Axolotl Academic Publishing Company. 4. Sheeler, P. and D.E. Bianchi. 1987. *Cell and Molecular Biology*. Canada: John Wiley & Sons. 5. Thorpe, N.O. 1984. *Cell Biology*. New York: John Wiley & Sons. 6. Albert, B., et al. 1983. *Molleculer Biology of The Cell*. New York: Garland Publishing Inc.
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Kelistrikan dan Kemagnetan* Electricity and Magnetism
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103068
Abbreviation, if applicable:	KK
Courses included in the module, if applicable:	Not applicable
Semester/term	5 / fourth year (senior)
Module coordinator(s):	Mohammad Budiyanto
Lecturer(s):	An Nuril Maulida F Eny Susiyawati M. Arif Mahdiannur
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	General Physic
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Tracing data and information about electricity and magnetism and its use in everyday life 2. Analyzing the symptoms of static electricity in objects and living things and their application by utilizing science and technology 3. Analyzing the symptoms of dynamic electricity in objects and living things and their application by utilizing science and technology 4. Analyzing the symptoms of magnetism, magnetic induction, and electromagnetic induction in living things and living things and their application by utilizing science and technology 5. Analyzing resistance, inductors and capacitors in alternating current circuits
Content:	Electric and magnetic properties, electric charge, Coulomb's Law, electric field strength, Gauss's law, Electric Potential, Capacitance capacitors, symptoms of static electricity in objects and living things, direct electrical circuits, Kirchoff's Law, dynamic electrical symptoms in objects and living things, magnetic and electromagnetic induction, symptoms of magnetism in living things and being, symptoms of

<table>
<tr><td></td><td>magnetic and electromagnetic induction in living things and being, RC and RL circuits, Resistance and capacitance, and current and voltage in AC circuits</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table><tr><th>Assessment Components</th><th>Percentage Contribution</th></tr><tr><td>Participation</td><td>20%</td></tr><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table></td></tr>
<tr><td>Learning Methods</td><td>Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint, hand out, simulation, e-learning Vinesa, and whiteboard</td></tr>
<tr><td>Literature (primary references):</td><td>1. Halliday & Resnick. 2013. Fundamental of Physics, 10th Edition. John Wiley & Sons Inc.
2. Giancoli, Douglas. 2016. Physics: Principles with Applications II Global Edition. California: Addison-Wesley.
3. Young, Hugh D., Freedman, Roger A., Ford, Albert Lewis. 2016. Sears and Zemansky's University Physics: With Modern Physics. Pearson.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Metodologi Penelitian* (Research Methodology)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103094
Abbreviation, if applicable:	Metpen
Courses included in the module, if applicable:	Not applicable
Semester/term	V/third year (junior)
Module coordinator(s):	Dr. Wahono Widodo, M.Si.
Lecturer(s):	Dr. Wahono Widodo, M.Si. Dr. Elok Sudibyo, M.Pd. Siti Nurul Hidayati, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Apply research methods to solve educational problems according to related fields of study; 2. Master the concepts of educational research including research paradigms, types of research, studies of current research articles, variables, research designs, research instruments, research techniques, data analysis and interpretation of research results, as well as steps for preparing proposals. and research reports; 3. Have skills in compiling educational research proposals according to the field of study; and 4. Having a responsible attitude towards the process and results of the research that has been done.
Content:	This course examines research paradigms, research approaches, types of research, studies of recent research articles, hypotheses, variables, research designs, research instruments, research techniques, data analysis and interpretation of research results, as well as steps for preparing proposals and research report. This course is presented in theory and an assignment for the preparation

<table>
<tr><td></td><td>of an educational research proposal as the final product of the course.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table><tr><th>Assessment Components</th><th>Percentage Contribution</th></tr><tr><td>Participation</td><td>20%</td></tr><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table></td></tr>
<tr><td>Learning Methods:</td><td>Constructivist, student-centred approach, lecturing, discussion, and presentation (structured activities)</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, and worksheets</td></tr>
<tr><td>Literature (primary references):</td><td>1. Creswell, J.W. 2008. Educational Research: Planning, Conducting, and Evaluating Quantitative Research. 3rd Edition. New Jersey: Pearson Prentice Hall.
2. Fraenkel, J.R., Wallen, N.E., Hyun, H. H. 2012. How to Design and Evaluate Research in Education. New York: McGraw-Hill Companies, Inc.
3. Cohen, Louis., Manion, Lawrence., Morrison, Keith. 2007. Research Methods in Education. Sixth Edition. New York: Routledge.
4. Tim Kurikulum Unesa. 2014. Pedoman Panduan Penulisan Skripsi Mahasiswa S-1.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

SEMESTER VI

Module Name:	*Statistik Pendidikan* (Statistics of Education)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103168
Abbreviation, if applicable:	Statpen
Courses included in the module, if applicable:	Not applicable
Semester/term	V/third year (junior)
Module coordinator(s):	Dr. Elok Sudibyo, M.Pd.
Lecturer(s):	Dr. Elok Sudibyo, M.Pd. Dra. Martini, M.Pd. Muhamad Arif Mahdiannur, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Explain dan apply descriptive statistics concepts and formulation to analyse data from science education research; 2. Explain dan apply inferential statistics basic concept and formulation to analyse and evaluate based-on data obtained from science education research; 3. Explain and apply the formulation to evaluate the effectiveness of an intervention in science education research based-on pre-test and post-test results (gain score analysis, normalized gain, normalized change, loss score analysis, normalized loss, Cohen's d, and weighted linear regression index); and 4. Explain and apply the basic concept and formulation of minimal completeness criteria in science education research practices in Indonesia.
Content:	Descriptive statistics (maximum, minimum, mean, mode, median, standard deviation, and standard error); inferential statistics: parametric and non-parametric (normal distribution, hypothesis testing, regression, ANOVA, and multivariate statistics); the formulation to evaluate the effectiveness of an intervention in science

<table>
<tr><td></td><td>education research based-on pre-test and post-test results (gain score analysis, normalized gain, normalized change, loss score analysis, normalized loss, Cohen's d, and weighted linear regression index); and science education research practices in Indonesia.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table><tr><th>Assessment Components</th><th>Percentage Contribution</th></tr><tr><td>Participation</td><td>20%</td></tr><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table></td></tr>
<tr><td>Learning Methods:</td><td>Constructivist, student-centred approach, lecturing, discussion, and presentation (structured activities)</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, and worksheets</td></tr>
<tr><td>Literature (primary references):</td><td>1. Quirk, T.J., 2016. Excel 2016 for educational and psychological statistics: A guide to solving practical problem. Springer.
2. Abbott, M.E., 2011. Understanding educational statistics using Microsoft Excel® and SPSS®. Wiley.
3. Hake, R.R., 1998. Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics course. American Journal of Physics, 66 (1).
4. Marx, J.D. and Cumming, K., 2007. Normalized change. American Journal of Physics, 75, 87-91.
5. Dellwo, D.R., 2010. Course assessment using multi-stage pre/post testing and the component of normalized change. Journal of Scholarship of Teaching & Learning, 10.
6. Direnga, J., Timmermann, D., Brose, A., and Kautz, C., 2014. A statistical method for assessing teaching effectiveness based on non-identical pre- and post-tests. SEFI 2014 Proceedings.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Analisis IPA Sekolah* (Science School Analysis)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420102005
Abbreviation, if applicable:	AIS
Courses included in the module, if applicable:	Not applicable
Semester/term	V/third year (junior)
Module coordinator(s):	Dr. Mohammad Budiyanto, M.Pd.
Lecturer(s):	Enny Susiyawati, Ph.D. Wahyu Budi Sabtiawan, S.Si., M.Pd., M.Sc. Dhita Ayu Permata Sari, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 79 total hours per semester ~ 3.18 ECTS**
Credit point:	2 *sks* (3.18 ECTS)
Requirements:	Curiculum Review
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Understand principles/laws/theories at junior high school learning topics; and 2. Apply principles/laws/theories to various natural science phenomena at junior high school learning topics.
Content:	Principles/laws/theories at junior high school learning topics
Attribute Soft skill:	Collaboration and argumentation in the natural classroom setting.
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

Assessment Components	Percentage Contribution
Participation	20%
Assignment	30%
Mid-semester test	20%
Final semester test	30%
Total	**100%**

Learning Methods	Discussion, and presentation (structured activities), and flip learning
Form of Media:	LCD, PowerPoint slides, and virtual learning platform
Literature (primary references):	1. Curriculum Documents of Indonesia at Junior High School Level For Natural Science Subject 2. Teacher and Student's Book at Junior High School Level For Natural Science Subject 3. Giancoli, D. C. (2016). Physics: principles with applications. Boston: Pearson. 4. Reece, J. B., Urry, L. A., Cain, M. L., Wasserman, S. A., Minorsky, P. V., & Jackson, R. B. (2014). Campbell biology (No. s 1309). Boston, MA: Pearson. 5. Brady, James.E. 2004. General Chemistry. Principle and Structure. 4th. ed. New York. John Willey and Sons, Inc.
Notes:	*__1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)__ according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	**__1 sks = 1,59 ECTS__

Module Name:	*Gelombang Optik* (wave and Optics)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103049
Abbreviation, if applicable:	GO
Courses included in the module, if applicable:	Not applicable
Semester/term	VI/sixth year (senior)
Module coordinator(s):	Dr. Mohammad Budiyanto, M.Pd.
Lecturer(s):	Laily Rosdiana, S.Pd., M.Pd. An Nuril Maulida F., S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	General Physics (8420103045)
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Utilizing scince and technology to trace data and information about properties of waves and optics and their use, as well as a tool to communicate search result 2. Analyze wave symptoms and optics for solving relevant problems 3. Able to make strategic decisions based on data and information about waves and optics throught practicum activities in te laboratory 4. Responsible for self learning, assignments, and agreements with colleagues
Content:	The basics of vibration, waves, light, optical devices and their application in everyday life
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

Assessment Components	Percentage Contribution
Participation	20%
Assignment	30%

	<table><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table>
Learning Methods	Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities), and flip learning
Form of Media:	LCD, PowerPoint, hand out, simulation, and whiteboard and e-learning unesa (https://vinesa.unesa.ac.id/course/view.php?id=423)
Literature (primary references):	1. Bass, Michael. 1995. *Hand Book Of Optics*. United States: McGraw-Hill Office 2. Crowell, Benjamin. 2003. *Vibrations and Waves*. California: Fullerrton 3. Sahara Muslim. 2004. *Gelombang dan Optik.* Jakarta : Depdikbud Dikti 4. Serway, Raymond. A. 2012. *Serway College Physic 9 Edition*. Chengage Brain User.
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Seminar* (Seminar)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420102142
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	VI/third year (junior)
Module coordinator(s):	Dr. Wahono Widodo, M.Si.
Lecturer(s):	All lecturers
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 100 minutes lectures, 2 x 70 minutes structured activity, 14 weeks per semester, 79 total hours per semester ~ 3.18 ECTS**
Credit point:	2 *sks* (3.18 ECTS)
Requirements:	Research Method
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Master the basics of making research proposals/articles in science education that reflect the ability of reasoning to formulate procedural problem solving in science education. 2. Make strategic decisions based on data and information. Including the results of input, ideas, ideas, colleagues, colleagues, references, and provide ideas for choosing various alternative solutions. 3. Responsible for the task of making and presenting research proposals and / or articles.
Content:	This course discusses the role of seminars in science education, library / field / laboratory studies on a topic in science education, writing study results in the form of papers (research proposal) and / or articles, and presenting them orally in seminars.
Attribute Soft skill:	Collaboration and argumentation in the natural classroom setting.
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

Assessment Components	Percentage Contribution
Participation	20%

<table>
<tr><td></td><td>
<table>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Discussion, project-based learning and presentation (structured activities)</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, and virtual learning platform</td></tr>
<tr><td>Literature (primary references):</td><td>1. Tim Jurnal Unesa. 2012. Template e-journal unesa. www.ejournal.unesa.ac.id
2. Tim. 2005.Pedoman Penulisan Skripsi Universitas Negeri Surabaya. Surabaya: Unesa University Press.
3. Widodo, W. 2004. Penulisan Karya Ilmiah. Jakarta: Direktorat PSMP.
4. Tim Seminar Nasional. 2013. Prosiding Seminar Nasional Pendidikan Sains Tahun 2013. Surabaya: Unesa University Press.
5. Tim Seminar Nasional. 2012. Prosiding Seminar Nasional Pendidikan Sains Tahun 2012. Surabaya: Unesa University Press
6. Widodo, W. 2004.Penulisan Karya Ilmiah. Jakarta: Direktorat PSMP.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

SEMESTER VII

Module Name:	*Kuliah Kerja Nyata (KKN)* (Community Service)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103178
Abbreviation, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	VII/fourth year (senior)
Module coordinator(s):	Institute for Research and Community Services (LPPM), Universitas Negeri Surabaya
Lecturer(s):	Team
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	• Field Work • 3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 170 minutes activities, 16 weeks per semester, 136 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Demonstrate collaborative attitude and independence in carrying out individual task and group assignment; 2. Directly communicate with social community; 3. Observe, analyse and find potential challenges that exist in the community as a basis for making community service program; 4. Planning community service program in order to improve the life quality of the community; and 5. Carried out the community service program and evaluate it comprehensively.
Content:	This field course is to develop competence in understanding and applying the principles of interaction and communication in the environment of community life, and in helping the community both through ideas and skills in efforts to advance the community in their environment by planning the community service program, disseminating the program, evaluation of the program.
Attribute Soft skill:	Discipline, honesty, responsibility, communication, and cooperation/collaboration
Study/exam achievements:	The final mark will be weight as follow: (1) individual assignment; (2) team assignment; and (3) program assessment.

Learning Methods	-
Form of Media:	-
Literature (primary references):	1. Community Services Guideline from University 2. Other relevant sources related to the program each group
Notes:	*__1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)__ according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	**__1 sks = 1,59 ECTS__

Module Name:	*Pengenalan Lapangan Persekolahan* (Teaching Internship)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420104182
Abbreviation, if applicable:	PLP
Courses included in the module, if applicable:	Not applicable
Semester/term	7/ fourth year (senior)
Module coordinator(s):	LPPPM
Lecturer(s):	Tim
Language:	Bahasa Indonesia (Indonesian language)
Classification within the curriculum:	Compulsory Course/ ~~Elective Studie~~s
Teaching format/class hours per week during the semester:	4 contact hours of lecturer (Indonesia credit semester or sks*)
Workload:	4 x 50 minutes lectures, 4 x 60 minutes structured activity, 4 x 60 minutes individual activity, 16 weeks per semester, 119 total hours per semester ~ 6.36 ECTS**
Credit point:	4 *sks* (6.36 ECTS)
Requirements:	-
Learning goals/competencies:	**General Competencies (Knowledge):** Students can explain concepts, coverage, and examples of activities of observation, analysis and evaluation of activities related to school culture, school management, formal activities, curricular, co-curricular, and extracurricular activities. **Specific Competence:** 1. Manifesting an honest and independent character related to duties. 2. Have knowledge of the concept, scope, and example of the activities of observation, analysis and evaluation of activities related to school culture, school management, formal activities, curricular, co-curricular, and extracurricular activities. 3. Have the ability to utilize information and multimedia technology in practicing developing clinical supervision, school-based management, planning, implementing and evaluating learning by paying attention to the diversity of students based on the guidance of the Pamong Teacher and Supervisor. 4. Have an understanding of the concepts in decision making to develop approaches / methods, designs (syllabus), procedures (techniques in the classroom), materials and learning media based on observations in school.

<table>
<tr><td></td><td>5. Responsible for communicating the results of observations in developing planning, implementing and evaluating learning through teaching training.</td></tr>
<tr><td>Content:</td><td>This course provides an understanding of the activities of observation, analysis and direct appreciation of activities related to school culture, school management, planning, implementation and evaluation of learning by taking into account the diversity of students, formal, curricular, co-curricular and extracurricular activities as well as school dynamics as an educational and learning development institution.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>University students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on following weight:
<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table></td></tr>
<tr><td>Learning Methods</td><td>Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint, hand out, simulation, e-learning Vinesa, and whiteboard</td></tr>
<tr><td>Literature:</td><td>1. Arend, R.I., 2012. Learning to Teach. New York: Mc Grow-Hill International Edition.
2. Hyland, Ken., & Wong, Lilian L. C. 2016. Innovation and Cange in English Language Education. London: Ruthledge.
3. Muliawan, Jasa Ungguh. 2017. 45 Model Pembelajaran Spektakuler. Jogjakarta: AR-Ruzz Media.
4. Mulyasa, E., 2004. Manajemen Berbasis Sekolah: Konsep, Strategi, dan Implementasi. Bandung: Remaja Rosdakarya.
5. Sani, Ridwan Abdullah. 2016. Inovasi Pembelajaran. Jakarta: Bumi Aksara.
6. Taniredja, Tukiran dkk. 2015. Model-Model Pembelajaran Inovatif dan Efektif. Bandung: Alfabeta.
7. Wena, Made. 2016. Strategi Pembelajaran Inovatif Kontemporer: Suatu Tinjauan Konseptual Operasional. Jakarta: Bumi Aksara.</td></tr>
<tr><td>Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year</td></tr>
</table>

	2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	**1 sks = 1,59 ECTS

SEMESTER VIII

Module Name:	*Skripsi* (Thesis)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420106146
Abbreviation, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	VIII/fourth year (senior)
Module coordinator(s):	Prof. Dr. Erman, M.Pd.
Lecturer(s):	Team from the UPSE
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory / ~~Elective~~
Teaching format/class hours per week during the semester:	6 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	6 x 100 minutes lectures (consultation/discussion with advisors), 6 x 70 minutes structured activity, 16 weeks per semester, 272 total hours per semester ~ 9.54 ECTS**
Credit point:	6 *sks* (9.54 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Conducting science education research as a formulation of ideas, concepts, thinking patterns, and creativity under the advisors' direction; 2. Disseminate science learning ideas both written and orally based on honesty and research ethics; and 3. Take responsibility for the results of research and conduct its evaluation.
Content:	This course is intended to develop competence in conducting science education research as a formulation of ideas, concepts, thinking patterns, and creativity that is packaged in an integrated and comprehensive manner, and communicated in a scientific format, scientific packaging in the form of a final thesis arranged in several rational ways - empirical starts from submitting a research proposal to taking responsibility for it in front of the board of examiners.
Attribute Soft skill:	Discipline, honesty, responsibility, communication, and cooperation
Study/exam achievements:	The final mark will be weight as follow: **Assessment Components** | **Percentage Contribution** Proposal | 50%

	Defending thesis (Performance, ability to answer the questions, and knowledge or ideas)	50%
	Total	**100%**
Learning Methods	-	
Form of Media:	-	
Literature (primary references):	1. Thesis Writing Guideline 2. Other relevant sources (journals, books, proceedings, etc.)	
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.	
	****1 sks = 1,59 ECTS**	

ELECTIVE COURSES

Module Name:	*Dasar-dasar Bioteknologi* (Introductory of Biotechnology)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420102029
Abbreviation, if applicable:	Biotech
Courses included in the module, if applicable:	Not applicable
Semester/term	Elective
Module coordinator(s):	Hasan Subekti, M.Pd.
Lecturer(s):	Dra. Evie Ratnasari, M.Si.; Hasan Subekti, M.Pd.; Aris Rudi Purnomo, S.Pd., M.Pd., M.Sc.
Language:	*Dasar-dasar Bioteknologi* (Fundamentals of Biotechnology)
Classification within the curriculum:	Elective
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 79.33 total hours per semester ~ 3.18 ECTS**
Credit point:	2 *sks* (3.18 ECTS)
Requirements:	General Biology (Code: 8420103023)
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, university students have ability to; 1. Applying its field of expertise in the pedagogical field of Integrated Science and utilizing IPTEKS to explore, collect, and evaluate (data and/or information) to solve learning literature professionally according to the situations and challenges faced. 2. Mastering the carrying, BKPM, and methods related to food engineering (fermentation techniques, agricultural engineering, engineering techniques), and bioethics, as well as how to teach research-based techniques to support their profession and solve the literature of learning Knowledge Integrated (professional). 3. Able to make appropriate decisions based on analysis of information and data to solve literature related to food techniques, both independently and in groups. 4. Products attitudes are able to cooperate and have social sensitivity (caring) as well as an attitude of responsibility in carrying out their professional duties.

<table>
<tr><td>Content:</td><td>Biotechnology in the context of the 21st century, bioinformatics, the principles of biotechnology (food) involves fermenting biotechnology, agricultural biotechnology, biotechnology engineering, and bioethics, as well as how to teach biotechnology with Integrating entrepreneurial perspectives.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Constructivism, student-centered approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets, and e-learning Vinesa (https://vinesa.unesa.ac.id)</td></tr>
<tr><td>Literature (primary references):</td><td>1. Chin. M.L., Field L., Schmidt J., Scritchfield R., & Toner, C. (2013). Food Biotechnology: A Communicator’s Guide to Improving Understanding 3rd Edition. California.
2. Schmid, R. D., & Dannert, C. S. (2016). Biotechnology: An Illustrated Primer. Weinheim: Wiley.
3. Thieman, W.J., & Palladino, M.A. (2013). Introduction to Biotechnology. International edition, 3ed. Boston: Pearson.
4. Subekti, H., Handriyan, A., Rudi, A. P., Eka, F. W., & Trisna, A. W. (2019). Bioteknologi: Sebuah Pembelajaran Terintegrasi STEM pada Mata Kuliah Bioteknologi bagi Mahasiswa Calon Guru IPA. Surabaya: Graniti.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Etnosains* (Ethnoscience)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103038
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	Elective
Module coordinator(s):	Beni Setiawan, S.Pd., M.Pd.
Lecturer(s):	Dr. Hasan Subekti, M.Pd. Ahmad Qosyim, S.Si., M.Pd. Wahyu Budi Sabtiawan, S.Si., M.Pd., M.Sc.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Elective
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	-
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Understand principles/laws/theories of basic knowledge implemented in various local wisdom; and 2. Apply principles/laws/theories of basic knowledge to various local wisdom.
Content:	Principles/laws/theories of natural sciences in various local wisdom
Attribute Soft skill:	Collaboration, communication, and argumentation in the natural classroom setting.
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:
Learning Methods	Discussion, observation, project-based learning, and presentation (structured activities), and flip learning

Assessment Components	Percentage Contribution
Participation	20%
Assignment	30%
Mid-semester test	20%
Final semester test	30%
Total	**100%**

Form of Media:	LCD, PowerPoint slides, laboratory equipments and materials, and virtual learning platform
Literature (primary references):	1. Cross, R., & R.F. Price. 1992. Teaching Science for Social Responsibility. Sydney: St. Louis Press. 2. Suastra, W.I. 2009. Merekonstruksi Sains Asli (Indegenous Science) dalam Upaya Mengembangkan Pendidikan Sains Berbasis Budaya Lokal di Sekolah. Bali: Jurusan Pend. Fisika IKIP Singaraja. 3. Sudarmin, Zaenuri, dan Parmin. 2013. Merekonstruksi Pengetahuan Sains Ilmiah Berbasis Budaya dan Kearifan Lokal di Wilayah Kepulauan Karimunjawa sebagai Wahana Menanamkan Soft Skill Karakter Konservasi pada Mahasiswa. Laporan Penelitian Dasar. LP2M Unnes. 4. Spradley, J.P. 2007. Metode Etnografi. Edisi Kedua (diterjemahkan oleh Misbah Zulfa Elizabeth). Yogyakarta: Tiara Wacana.
Notes:	***1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)** according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	****1 sks = 1,59 ECTS**

Module Name:	*Kimia Rumah Tangga* (Household Chemistry)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420102073
Abbreviation, if applicable:	KRT
Courses included in the module, if applicable:	Not applicable
Semester/term	Elective
Module coordinator(s):	Siti Nurul Hidayati, S.Pd., M.Pd.
Lecturer(s):	**Siti Nurul Hidayati, S.Pd., M.Pd.** **Wahyu Sabtiawan, S.Si., M.Pd**
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Elective
Teaching format/class hours per week during the semester:	2 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 79,3 total hours per semester ~ 3,18 ECTS**
Credit point:	2 *sks* (3,18 ECTS)
Requirements:	Solution, basic biochemistry, Biochanic
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** 1. Able to take advantage of science and technology in studying matters related to household chemicals, additives in food, addictive substances (psychotropic) and able to adapt to situations faced in solving problems. 2. Mastering the theoretical concepts of household chemicals, additives in food, addictive substances (psychotropics) in depth and formulating them in procedural problem solving. 3. Able to make decisions based on analysis of information and data and provide guidance in choosing alternative solutions. 4. Responsible for informing the results of analysis of information and data both orally and in writing.
Content:	Scientific Method, Matter and Properties of Matter, Periodic System of Elements, Chemical Bonds, Stoichiometry, Solutions, Colloid Systems,
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

<table>
<tr><td></td><td>
<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>Learning Methods</td><td>Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint, hand out, simulation, and whiteboard and e-learning unesa (https://vinesa.unesa.ac.id/course/view.php?id=423)</td></tr>
<tr><td>Literature (primary references):</td><td>1. Helmprecht. H.L. and Friedman. L.T. 1997. basic Chemistry for The Life Sciences. New York : Mc Graw Book Company
2. Pusat Perbukuan. 2003. Ensiklopedia Sains dan Kehidupan. Jakarta : Depdiknas
3. Lucy T Pride. 2010. Environmental chemistry an intoduction. Cumming publishing company.</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Atom dan Radioaktivitas* (Atom and Radioactivity)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103171
Abbreviation, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	Elective
Module coordinator(s):	Wahono Widodo
Lecturer(s):	Wahono Widodo Ernita Vika Aulia
Language:	Bahasa Indonesia (Indonesian language)
Classification within the curriculum:	Elective
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	- General Physics - General Chemistry
Learning goals/competencies:	**General Competencies (Knowledge):** Students can explain Dalton's atomic model, Thomson's atomic model, Rutherford's experiments on scattering alpha particles, Rutherford's atomic model, Bohr's atomic model, Bohr's hydrogen energy level and spectrum, modern atomic model (wave mechanics), radioactivity symptoms, decay, half-life, binding energy, reactions fission and fusion, and elementary particles. **Specific Competence:** 1. Mendeskripsikan konsep atom menurut Dalton, Thomson, Rutherford, Bohr, dan model atom menurut Teori Atom Modern. 2. Melakukan analisis keterkaitan sifat-sifat komponen penyusun inti atom dengan radioaktivitas. 3. Menganalisis sifat-sifat sinar radioaktif berdasarkan interaksinya dengan bahan yang dapat diobservasi. 4. Menganalisis model matematis peluruhan radioaktif. 5. Menganalisis energi yang dihasilkan atau yang diperlukan pada suatu reaksi inti. 6. Mendeskripsikan karakteristik utama partikel-partikel kosmik. 7. Mendeskripsikan partikel-partikel elementer dan interaksinya.

<table>
<tr><td></td><td>8. Menjelaskan pemanfaatan sinar radioaktif.
9. Menjelaskan konstruksi PLTN</td></tr>
<tr><td>Content:</td><td>This course examines the Dalton atomic model, Thomson atomic model, Rutherford experiment on alpha particle scattering, Rutherford atomic model, Bohr atomic model, energy levels and the spectrum of the Bohr hydrogen atom, modern atomic models (wave mechanics), radioactivity symptoms, decay, time. beaks, binding energy, fission and fusion reactions, and elementary particles.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>University students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on following weight:
<table>
<tr><th>Assessment Components</th><th>Percentage Contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table></td></tr>
<tr><td>Learning Methods</td><td>Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint, hand out, simulation, e-learning Vinesa, and whiteboard</td></tr>
<tr><td>Literature:</td><td>1. Arthur Beiser. 1987. Fisika Modern, EdisiKeempat. Jakarta: Erlangga. (BukuTerjemahan)
2. Michael F. L'Annunziata. 2007. Radioactivity: Introduction and History. Amsterdam: Elservier.
3. S.B. Pate. 1991. Nuclear Physics: An Introduction. New Delhi: New Age International Ltd.
4. Timberlake and Timberlake. 2011. Basic Chemistry, 3rd Edition. US: Pearson.</td></tr>
<tr><td>Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Kajian Hasil penelitian Pendidikan IPA* Review of Science Research Findings
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103064
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not applicable
Semester/term	Elective
Module coordinator(s):	Prof. Dr. Erman, M.Pd.
Lecturer(s):	Dra. Martini, M.Pd. Dr. Mohammad Budiyanto, M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	~~Compulsory~~ / Elective
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	Research method, Statistics of Education.
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Explore articles in international journals and nationally accredited journals in the category of science education from various sources by utilizing science and technology results 2. Conduct an analysis of articles on science education research results 3. Presenting the results of the analysis of science education research articles
Content:	Discussion of at least 5 recent articles (last 5 years) published through international journals (4 articles) and those published through nationally accredited journals (1 article) that are relevant to student thesis research ideas through search, analysis, summary, preparation, and presentation activities.
Attribute Soft skill:	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Study/exam achievements:	Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

Assessment Components	Percentage Contribution
Participation	20%

	<table><tr><td>Assignment</td><td>30%</td></tr><tr><td>Mid-semester test</td><td>20%</td></tr><tr><td>Final semester test</td><td>30%</td></tr><tr><td>Total</td><td>100%</td></tr></table>
Learning Methods	Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities)
Form of Media:	LCD, PowerPoint, hand out, simulation, e-learning Vinesa, and whiteboard
Literature (primary references):	1. Jourrnal of Research in Science Teaching, Vol 54, No. 4 April, 2017, Wiley & Son 2. Journal of Teaching Science, 56 (1), March 2010, ASTA 3. Journal of Teaching Science, 56 (2), June 2010, ASTA 4. Journal of Teaching Science, 56 (3), June 2010, ASTA 5. Jurnal Penelitian Pendidikan IPA Indonesia, PPII & Unnes 6. Jurnal Ilmu Pendidikan (JIP), Ikatan Sarjana Pendidikan Indonesia, UM 7. Jurnal lain yang relevan
Notes:	*__1 *sks* in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes)__ according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	**__1 sks = 1,59 ECTS__

Module Name:	*Dasar-Dasar Elektronika* (Introductory of Electronics)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103170
Abbreviation, if applicable:	
Courses included in the module, if applicable:	Not applicable
Semester/term	Elective
Module coordinator(s):	Wahono Widodo
Lecturer(s):	Wahono Widodo Laily Rosdiana An Nuril Maulida Fauziah
Language:	Bahasa Indonesia (Indonesian language)
Classification within the curriculum:	Elective
Teaching format/class hours per week during the semester:	3 contact hours of lecturer (Indonesia credit semester or sks*)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 3.97 ECTS**
Credit point:	3 *sks* (3.97 ECTS)
Requirements:	- General Physics - Electicity and Magnetism
Learning goals/competencies:	**General Competencies (Knowledge):** Students can explain the theory of semi-conductors, extrinsic p and n types and p and n connections, diodes, transistors as resistance and switching, power amplifiers, op-amps, oscillators, digital electronics, and logic circuits. **Specific Competence:** 1. Utilizing science and technology in the theoretical fields of semi-conductor, p and n type extrinsics and p and n connections, diodes, transistors, and able to adapt to the situation at hand in problem solving. 2. Mastering theoretical concepts in the theoretical fields of semi-conductor in an in-depth manner, extrinsic types p and n and p and n connections, diodes, transistors, and formulate them in procedural problem solving. 3. Make decisions based on analysis of information and data and provide guidance in choosing alternative solutions. 4. Responsible for informing the results of analysis of information and data both orally and in writing.
Content:	This course discusses the theory of the semi-conductor of the electrical, extrinsic types p and n and the connection of

<table>
<tr><td></td><td>p and n, diodes, transistors as resistances and switches, power amplifiers, op-amps, oscillators, digital electronics, and logic circuits. Lectures are carried out with modeling, presentations, discussions, and practicum.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>University students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on following weight:
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<tr><td>Learning Methods</td><td>Student-centered approach, deductive learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint, hand out, simulation, e-learning Vinesa, and whiteboard</td></tr>
<tr><td>Literature:</td><td>1. Agung Nugroho, 2010. Mekatronika. Yogyakarta: Graha Ilmu
2. Brophy. 1992. Basic Elektronic for Scientist and Engineers. Jhon Wiley
3. Dwi Sunar, 2008. Belajar Sistem Cepat Elektronika. Yogyakarta: Absolut
4. Thomas Sri W, 2002. Elektronika Dasar. Salemba Teknik</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 sks = 1,59 ECTS</td></tr>
</table>

Module Name:	*Pengetahuan Bumi dan Antariksa* (Earth and Planetary Science)
Module Level:	Bachelor degree/Undergraduate Programme
Course Code:	8420103123
Abbreviation, if applicable:	PBA
Courses included in the module, if applicable:	Not applicable
Semester/term	Elective
Module coordinator(s):	Dr. Wahono Widodo, M.Si.
Lecturer(s):	Dr. Wahono Widodo, M.Si. An Nuril Maulida Fauziah, S.Pd., M.Pd. Muhamad Arif Mahdiannur, S.Pd., M.Pd.
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Elective
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or *sks**)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit point:	3 *sks* (4.77 ECTS)
Requirements:	General Physics (8420103045) General Chemistry (8420103074) General Biology (8420103023) Biodiversity (8420103065) Introductory of Biochemistry (8420103163) Wave and Optics (8420103049) Atom and Radioactivity (8420103171)
Learning goals/competencies:	**Course Learning Outcomes (CLOs):** After taking this course, students will be able to: 1. Apply principles/laws/theories to various the Earth physical phenomena; 2. Apply principles/laws/theories to various physical phenomena in the solar system and universe; 3. Applying substantive concepts (principles/laws/ theories) in the field of the Earth and space science in making science learning media; and 4. Design and conduct the Moon observation experiments based-on substantive and procedural concepts.
Content:	Lithosphere, Volcanoes, Earthquakes, Hydrosphere and Its Pollution, the Atmosphere and the Factors that Influence It, the Solar system, the Earth, the Revolutions and Rotation of the Earth and Moon and their Effects on Humans and Culture, Star Evolution, and Cosmology.

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<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 40% of the maximum final grade. The final grade (NA) is calculated based on the following weight:

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<tr><td>Learning Methods</td><td>Constructivist, student-centred approach, project-based learning, lecturing, discussion, and presentation (structured activities), and flip learning</td></tr>
<tr><td>Form of Media:</td><td>LCD, PowerPoint slides, worksheets, telescope, and e-learning Vinesa (https://vinesa.unesa.ac.id/course/view.php?id=423)</td></tr>
<tr><td>Literature (primary references):</td><td>1. Trefil, J. and Hazen, R.M., 2016. The Sciences: An Integrated Approach. Wiley Global Education.
2. Lunine, J.I., 2013. Earth: evolution of a habitable world. Cambridge University Press.
3. Hewitt, P.G., Lyons, S.A., Suchocki, J.A. and Yeh, J., 2013. Conceptual Integrated Science: Pearson New International Edition. Pearson Higher Ed.
4. Roy, A.E. and Clarke, D., 2003. Astronomy: Principles and Practice, (PBK). CRC Press.
5. Ringwood, A.E., 2012. Origin of the Earth and Moon. Springer Science & Business Media.
6. Druyan, A., MacFarlane, S., Cannold, M., Braga, B. and Clark, J., 2014. The cosmos: A spacetime odyssey [Video Series]. Beverly Hills, CA: Twentieth Century Fox.
7. Selin, H. ed., 2012. Astronomy across cultures: the history of non-Western astronomy (Vol. 1). Springer Science & Business Media.
8. Tim Pengembang Bahan Ajar IPBA. n.d. Buku Ajar IPBA. Unesa University Press.</td></tr>
<tr><td>Notes:</td><td>*1 sks in learning process = three contact hours that consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
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