

Module designation	<i>Food and Nutrition</i>
Semester(s) in which the module is taught	1 <sup>st</sup> semester/1 <sup>st</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Ir. Nura Malahayati, M.Sc., Ph.D.</li> <li>2. Dr. Merynda Indriyani Syafutri, STP., M.Si.</li> <li>3. Friska Syaiful, STP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face-to-face lecture (offline) and E-Learning (online)
Workload (incl. contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for contact study, 120 minutes for structured academic assignment, and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the relationship between agriculture and food supply, and its impact on improving the quality of human resources.</li> <li>2. understand basic concepts including food and nutrition in the era of globalization, food and nutrition system, food consumption patterns. nutritional status, food security, food and nutrition regulations and policies.</li> <li>3. identify food and nutrition issues and their consequences, especially on health and population.</li> <li>4. evaluate an action plan to overcome malnutrition in Indonesia</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. The relationship between agriculture, food and nutrition</li> <li>2. Food and nutrition as indicator human development</li> <li>3. Globalization and food security, globalization and food safety, globalization, lifestyle and nutritional status</li> <li>4. Food and nutrition systems and classification of food and nutrition</li> <li>5. Nutritional needs and food consumption patterns</li> <li>6. Nutritional status assessment</li> <li>7. Food safety and post-harvest handling</li> <li>8. Food security and food diversification</li> <li>9. Integrated Nutrition and Program in Food and Nutrition, MDGs and SDGs</li> <li>10. Food and nutrition problems (malnutrition) and the relationship between food, nutrition and population</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Multiple choice exams</li> <li>2. Essay exams</li> </ol>

Reading List

1. P.B. Ali. 2021. Rencana Aksi Nasional Pangan dan Gizi 2021-2024. Badan Perencanaan Pembangunan Nasional.
2. Tim Penyusun KSKPG. 2019. Konsep Kebijakan Strategis Ketahanan Pangan dan Gizi. Badan Ketahanan Pangan Kementerian Pertanian. Sekretariat Dewan Ketahanan Pangan.
3. Indeks Ketahanan Pangan Indonesia 2018. Badan Ketahanan Pangan. Kementerian Pertanian.
4. Global Nutrition Report 2020.
5. Galanakis, C. 2020. Food Security and Nutrition. Elsevier.

Module designation	<i>Pancasila</i>
Semester (s) in which the module is taught	1 <sup>st</sup> semester/1 <sup>st</sup> year
Person responsible for the module	Dr. Hudaidah, M.Pd dan Pancasila Team Teaching
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lecture and project
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. explain the Introduction of Pancasila education and Pancasila education for the future : the concept, urgency, dynamics and challenges</li> <li>2. explain the concept, urgency, dynamics and challenges of Pancasila in the current history of the Indonesian nation</li> <li>3. explain the concept, urgency, dynamics and challenges of Pancasila as the basis of the State Foundation</li> <li>4. explain the concept, urgency, dynamics and challenges of Pancasila as a state ideology</li> <li>5. explain the concept, urgency, dynamics and challenges of Pancasila as a philosophical system</li> <li>6. explain the concept, urgency, dynamics and challenges of Pancasila as an ethical system</li> <li>7. explain the concept, urgency, dynamics and challenges of Pancasila as the basis for the value of science development</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction to Pancasila Education : the concept and urgency of Pancasila education, the reason for the need for Pancasila education, historical sources, sociological, Pancasila education politics</li> <li>2. The dynamics and challenges of Pancasila education and the essence and urgency of Pancasila education for the future</li> <li>3. Pancasila in the Current History of the Indonesian Nation</li> <li>4. Pancasila as the State Foundation</li> <li>5. Pancasila as the State Ideology</li> <li>6. Pancasila as a Philosophical System</li> <li>7. Pancasila as a System of Ethics</li> <li>8. Pancasila as the Basic Value of Science Development</li> <li>9. The dynamics and challenges of Pancasila as the basis for the value of science development</li> </ol>

Examination forms	<ol style="list-style-type: none"><li>1. Essay Assignments</li><li>2. Essay exams</li><li>3. Multiple choice exams</li></ol>
Reading List	<ol style="list-style-type: none"><li>1. Aiken, H. D. 2009 <i>Abad Ideologi</i>. Yogyakarta: Penerbit Relief.</li><li>2. Ali, As'ad Said. 2009. <i>Negara Pancasila Jalan Kemaslahatan Berbangsa</i>. Jakarta: Pustaka LP3ES.</li><li>3. Asdi, Endang Daruni. 2003. <i>Manusia Seutuhnya Dalam Moral Pancasila</i>. Jogjakarta: Pustaka Raja.</li><li>4. Bahm, Archie. 1984. <i>Axiology: The Science of Values</i>. New Mexico: Albuquerque.</li><li>5. Bahm, Archie. 1995. <i>Epistemology; Theory of Knowledge</i>. New Mexico: Albuquerque.</li><li>6. Bakker, Anton. 1992. <i>Ontologi: Metafisika Umum</i>. Yogyakarta: Kanisius.</li><li>7. Darmodihardjo, D. 1978. <i>Orientasi Singkat Pancasila</i>. Jakarta: PT. Gita Karya.</li></ol>

Module designation	<i>Indonesian (Indonesia Language)</i>
Semester (s) in which the module is taught	1 <sup>st</sup> semester/1 <sup>st</sup> year
Person responsible for the module	Dr. Zahra A., M.Pd. dan Indonesia Language Team Teaching
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lecture, and project
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. explain the birth of Indonesia</li> <li>2. explain the position, function, and legal force of the Indonesian language</li> <li>3. explain various academic texts; explain the characteristics of academic texts</li> <li>4. explain the structure of academic texts</li> <li>5. use proper spelling and punctuation in academic texts</li> <li>6. use effective sentences in academic texts</li> <li>7. understanding the essence of paragraphs; understand and use paragraph elements; understand and use paragraph types</li> <li>8. use quotes in writing and use bibliography in writing</li> <li>9. understand the characteristics of an essay</li> <li>10. explain the structure of essay writing</li> <li>11. write essays and present the resulting essay writing</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. History of Indonesian Language Development</li> <li>2. The position, function, and legal force of the Indonesian language</li> <li>3. Characteristics of academic texts</li> <li>4. Academic text structure</li> <li>5. Spelling and punctuation in academic texts</li> <li>6. The Nature of Effective Sentences; Characteristics of Effective Sentences; Sentence Structure; Types of Sentences</li> <li>7. The Nature of Paragraphs; Paragraph Forming Elements; Types of Paragraphs; Requirements for a Good Paragraph; Techniques and Patterns of Paragraph Development</li> <li>8. Systematics of writing quotes</li> <li>9. Systematics of writing a bibliography</li> <li>10. Characteristics of an essay</li> <li>11. Essay writing structure</li> </ol>

	<ol style="list-style-type: none"><li>12. Essay writing</li><li>13. Presentation of the resulting essay writing</li></ol>
Examination forms	<ol style="list-style-type: none"><li>1. Essay Assignments</li><li>2. Essay exams</li></ol>
Reading List	<ol style="list-style-type: none"><li>1. Cermat Berbahasa Indonesia untuk Perguruan Tinggi Negeri (E. Zaenal Arifin dan S. Amran Tasai, 2018)</li><li>2. Buku Praktis Bahasa Indonesia (Pusat Bahasa Depdiknas, 2016)</li><li>3. PUEBI (Pusat Bahasa, 2018)</li><li>4. KBBI Edisi VI (Pusat Bahasa, 2019)</li><li>5. Ketatabahasaan dan Kesusastraan (H.E Kosasih, 2008)</li><li>6. Inilah Esai (Muhidin M Dahlan, 2016)</li><li>7. Bahasa Indonesia untuk Perguruan Tinggi (Kemenristekditi, 2016)</li><li>8. Semua bahan yang mendukung</li></ol>

Module designation	<i>Mathematics</i>
Semester (s) in which the module is taught	1 <sup>st</sup> semester/1 <sup>st</sup> year
Person responsible for the module	Dr Ir Herlina Hanum, MSi and Mathematic Team Teaching
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lecture, practical, and project
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study, 160 minutes for practical, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Explain the concept of the real number system; Solving operations on real numbers.</li> <li>2. Distinguish between rational and irrational numbers; Understand and apply field Characteristic</li> <li>3. Explain the concept of inequality; Finding the solution to a simple inequality, absolute value, square root and square</li> <li>4. Draw quadrilateral coordinates and the given points</li> <li>5. Determine the point of intersection of the curve on the coordinate axis; Drawing equation graph</li> <li>6. Able to determine function value; Drawing function; Completing operations on functions</li> <li>7. Understand and solve trigonometric function problems</li> <li>8. Define Understanding the concept and limit theorem ; Determining the continuity of the function</li> <li>9. Understand the meaning of derivative; Understand the relationship between limits and derivatives ; Determine the derivative of sinus and cosinus</li> <li>10. Understand the concept of the chain rule; Solving the derivative of the composition function ; Write down the chain rule in the Leibniz way</li> <li>11. Determine the maximum/minimum critical points of a function</li> <li>12. Understand the concept of integrals and understand the rules for determining integrals</li> <li>13. Understand the concept of replacement method; Determine the integral function of the composition</li> <li>14. Form a matrix with a certain ordo; Performing operations on matrices</li> <li>15. Form a system of linear equations from the given case</li> </ol>

Content	<ol style="list-style-type: none"> <li>1. Real numeral system; Rational and irrational numbers; Operations on real numbers; Characteristif of Field</li> <li>2. Inequality; Absolute value; square root; square</li> <li>3. Quadrilateral coordinate system, point distance, straight line, slope of line</li> <li>4. The point of intersection of the curve; Draw an equation graph</li> <li>5. Definition of function; Drawing function; Sum operation and multiplication, Composition of functions and trigonometric functions</li> <li>6. Definition of limit; limit theorem; Continuity of function</li> <li>7. Definition of derivative through limit; derivate search rules; derivate sinus dan cosinus</li> <li>8. Leibniz Writing chain rule; High-level derivative</li> <li>9. Maximum-minimum function; monotony; Concavity</li> <li>10. Integral concept; Integral determination rule</li> <li>11. Integral of composition function (Replacement method</li> <li>12. Area of flat area</li> <li>13. Ordo matrix ; Transpose, sumation, multiplication; Determinant ; ajoin, dan cofactor Invers matrix</li> <li>14. System linear Of equations ; Form matrix from System linear of equations ; Solution System linear Of equations ; Notation sigma <math>\Sigma</math></li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Calculating Assignments</li> <li>2. Essay exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Eddy Supramono, <i>et al</i>, 2000, Matematika Dasar, Universitas Negeri Malang – JICA Project.</li> <li>2. Taufik Raman R., 2004. Matematika Dasar edisi revisi, Bandung: IMSTEP JICA.</li> <li>3. Afidah Khairunnisa, 2014, Matematika Dasar Untuk Universitas, Depdiknas–Dikti</li> </ol>



Module designation	<i>Inorganic Chemistry</i>
Semester (s) in which the module is taught	1 <sup>st</sup> semester/1 <sup>st</sup> year
Person responsible for the module	Dr. Muharni, M.Si and Inorganic Chemistry Team Teaching
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lecture, practical, and project
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study, 160 minutes for practical, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand and explain of material properties, substances and Compounds, classification and methods of measurement, the principles of the scientific method in the work of science.</li> <li>2. understand and explain of development of atomic theory and modern atomic theory</li> <li>3. understand and explain of periodic table</li> <li>4. understand and explain of the concept of chemical bond formation related to molecular geometry</li> <li>5. understand and explain of stoichiometry in chemical reactions</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Material properties, substances and compounds classification and methods of measurement,</li> <li>2. The principles of the scientific method in the work of science.</li> <li>3. Development of atomic theory and modern atomic theory</li> <li>4. The properties of atoms and the basis for the preparation of the periodic table, quantum mechanics</li> <li>5. The basic concepts of chemical bond formation, ionic and covalent bond</li> <li>6. The formation bond related to molecular geometry</li> <li>7. The basic concepts of stoichiometry in chemical reactions</li> <li>8. To calculate the reaction product when two or more reactions occur simultaneously</li> <li>9. To determine the reducing agent or oxidizing agent in the oxidation-reduction reaction, balance the oxidation-reduction reaction with the method of changing the oxidation number</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay exams</li> <li>2. Practical works</li> </ol>

Reading List

1. Brady and Holum, 1993, Chemistry, The Study of Matter and Its Changes, Jhon Wileys & Sons INC, New York
2. Keenan, Charles, W., Ilmu Kimia Untuk Universitas, Terjemahan, Jilid 1, edisi VI, Penerbit Erlangga, Jakarta
3. Petrucci, R. H., 1992, Kimia Dasar Prinsip dan Terapan Modern, Terjemahan, Jilid 1, edisi IV, Penerbit Erlangga, Jakarta

Module designation	<i>Biology</i>
Semester (s) in which the module is taught	1 <sup>st</sup> semester/1 <sup>st</sup> year
Person responsible for the module	Dr.Ir. Maria Fitriana, M.Sc and Biology Team Teaching
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lecture, practical, and project
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study, 160 minutes for practical, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understanding and able to explain the world of life, the world of animals, the world of plants</li> <li>2. understanding and able to describe organization of life</li> <li>3. understanding and able to explain population, habitat, community</li> <li>4. understanding and able to explain ecosystem, biosphere</li> <li>5. understanding and able to explain patterns of life on land and in water (fresh water, brackish water, seawater)</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Concept of the world of life, the world of animals, the world of plants</li> <li>2. Organization of life (cell, tissue, organs, organic system, organisms)</li> <li>3. Concept of individu and population</li> <li>4. Concept of population, habitat, community</li> <li>5. Concept of ecosystem, biosphere</li> <li>6. Concept of food chain and material cycle</li> <li>7. Concept of reproduction of organism</li> <li>8. Pattern of life on land</li> <li>9. Pattern of life in water (fresh water, brackish water, seawater)</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay exams</li> <li>2. Multiple choice exams</li> <li>3. Practical works</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Campbell, N. 2010. Biologi: Jilid 1. Edisi 8. Erlangga. Jakarta</li> <li>2. Sutiman, dkk. 2017. Biologi Se!. UB Press, Malang</li> <li>3. Zuliyanti. 2011. Biologi Se!. Universitas Terbuka: Jakarta</li> <li>4. Sutrian, Yayan. 2011. Pengantar Anatorni Turnbuh-turnbuhan: Sel dan Jaringan. Rineka Cipta. Jakarta</li> </ol>

Module designation	<i>Physics</i>
Semester (s) in which the module is taught	1 <sup>st</sup> semester/1 <sup>st</sup> year
Person responsible for the module	Drs. Hadir Kaban, MT and Physics Team Teaching
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lecture, practical, and project
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study, 160 minutes for practical, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand and explain physics introduction and Measurement of quantities and units</li> <li>2. understand and explain concepts of thermodynamic</li> <li>3. understand and explain concepts of mechanics</li> <li>4. understand and explain concepts of fluid</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Scientific Structure of Physics and Measurement of Quantities and Units</li> <li>2. Newton's Laws and Atwood's Plane</li> <li>3. Business and Energy Concepts</li> <li>4. Simple "Bandul", compound "Bandul", sound wave</li> <li>5. Mechanics: Momentum, Moment of Inertia</li> <li>6. Viscosity</li> <li>7. Fluid : (dynamic and static)</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay exams</li> <li>2. Multiple choice exams</li> <li>3. Practical works</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Alonso – Finn, " Fundamentals University Physics " Vol.1.</li> <li>2. Douglas G Giancoli, " PHYSYCS, Principles with Applications " Pearson, 2005</li> <li>3. Haliday – Resnick, " Fundamental of Physics " 2004</li> </ol>

Module designation	<i>Introduction to Agricultural Technology</i>
Semester (s) in which the module is taught	1 <sup>st</sup> semester/1 <sup>st</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Prof. Dr. Ir. Amin Rejo, M.P.</li> <li>2. Prof. Dr. Ir. Basuni Hamzah, M.Sc.</li> <li>3. Dr. Ir. Gatot Priyanto</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face-to-face lecture (offline) and E-Learning (online)
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand and explain the fundamental aspect and the main aspect of agricultural technology</li> <li>2. Understand and explain the general aspect of land management and utilization in agricultural technology</li> <li>3. Understand and explain the contribution of tools and machinery on Agricultural Technology; influencing factors of Postharvest Technology on Agricultural</li> <li>4. Understand and describe value and technoeconomic principle of Agricultural Technology</li> <li>5. Understand and describe General aspect of Agricultural Product Technology; principle element of Product handling and processing; fundamental aspect of agricultural product preservation; Value and brand image based on packaging</li> <li>6. Understand and describe the fundamental aspect on agroindustrial system and management; developing of Agricultural technology on Industrial 4.0</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Fundamental aspect of Agricultural Technology (Agricultural system and product handling and Technology as driving force in Agricultural Development)</li> <li>2. The Main aspect of Agricultural Technology</li> <li>3. General aspect of Land management and utilization in agricultural technology (I)</li> <li>4. General aspect of Land management and utilization in agricultural technology (II)</li> <li>5. Contribution of Tools and Machinery on Agricultural Technology</li> <li>6. Element of Postharvest Technology on Agricultural</li> <li>7. The value and technoeconomic principle of Agricultural Technology</li> <li>8. General aspect of Agricultural Product Technology</li> <li>9. Element of Product handling and processing</li> <li>10. Fundamental aspect of agricultural product preservation</li> </ol>

	<ol style="list-style-type: none"> <li>11. Value and brand image based on packaging</li> <li>12. Fundamental aspect on agroindustrial system and management</li> <li>13. Capita selecta: Agricultural technology on Industrial 4.0</li> <li>14. Student Focus Group Discussion: Case study report-special topic</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Oral presentation</li> <li>2. Essay exam</li> <li>3. Multiple choice exam</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Dieter, G.E. 1991. Engineering Design. 2ndEd. McGraw-Hill, International Ed. New York-Tokyo</li> <li>2. Meredith, D.D. et.al. 1992. Perancangan dan Perencanaan Sistem Rekayasa. (terjemahan: A. Maulana). Penerbit Erlangga, Jakarta</li> <li>3. Jun, S. and J.M.Irudayaraj. 2009. Food Processing Operation Modeling (Design and Analysis). 2ndEd. CRC Press Taylor and Francis Group. Boca Raton, London, New York.</li> <li>4. Sediawan, W.B. dan A. Prasetya. 1997. Permodelan Matematis dan Penyelesaian Numeris dalam Teknik Kimia. Penerbit. Andi Ofset, Yogyakarta.</li> <li>5. Geankoplis, C.J. 1999. Transport Process and Unit Operation. 3rded. , Allyn &amp; Bacon, Inc. Boston.</li> <li>6. Smith, J.S. and J.H. Hui. 2004. Food Processing, Principle and Application. Blackwell Publ. Iowa.</li> <li>7. Valentas, K.J., L.Levine dan J.P. Clark. 1991. Food Processing and Scale-up. Marcel Dekker, Inc.</li> <li>8. Saguy, I. 1983. Computer-Aided techniques in Food Technology. Marcel Dekker, Inc</li> <li>9. Heldman, D.R. dan D.B.Lund. 2007. Handbook of Food Engineering. 2nd.Ed. CRC Press-Taylor &amp; francis group. Boca Raton, London, New York.</li> <li>10. Wirakartakusumah, M.A., B. Nurtama, G. Priyanto dan M. Aprpah. 1992. Teknik Pangan Lanjut. Monograph. PAU Pangan dan Gizi IPB., Bogor.</li> </ol>

Module designation	<i>Analytical Chemistry</i>
Semester (s) in which the module is taught	2 <sup>nd</sup> semester/1 <sup>st</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Prof. Ir. Filli Pratama, M.Sc. (Hons), Ph.D.</li> <li>2. Dr. Ir. Parwiyanti, M.P.</li> <li>3. Dr. Merynda Indriyani Syafutri, S.TP.,M.Si.</li> <li>4. Dr. Eka Lidiasari, S.TP.,M.Si.</li> <li>5. Friska Syaiful, STP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face lecturer, project
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study, 160 minutes for practical, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. explain the principles of techniques and methods of analysis of food/agricultural products</li> <li>2. perform various basic and applied chemical analysis techniques on agricultural products</li> <li>3. select food/agricultural product analysis techniques that appropriate to the requirements and characteristics of the material.</li> <li>4. conduct research on the combination of operations for processing agricultural products, so that they can produce safe and quality agricultural products along the agricultural production chain, and can provide added value to agricultural products</li> <li>5. demonstrate independent, quality, and measureable performance</li> <li>6. make appropriate decisions in the context of solving problems in their area of expertise, based on the results of analysis of information and data</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Definition, Scope and Aim of Analytical Chemistry</li> <li>2. Principal of Laboratory Analytical and Good Laboratory Practise (GLP)</li> <li>3. Stages of Kuantitative Analytical</li> <li>4. Sampling Methode and Preparing of Solution</li> <li>5. Titrimetric Analytical</li> <li>6. Gravimetric Analytical</li> <li>7. Spectrofotometric Analytical</li> <li>8. Chromatography Analytical</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay exams</li> <li>2. Multiple choice exams</li> <li>3. Practical works</li> </ol>

Reading List

1. Harvey, D. 2016. Analytical Chemistry 2.1. McGraw-Hill Company. 1122 pages
2. Haines, P.J.; Kealey.D. 2002. Instant Notes: Analytical Chemistry. BIOS Scientific Publisher Limited. 353 pages.
3. Harvey, D. 2000. Modern Analytical Chemistry. McGraw-Hill Companies. 816 pages



Module designation	<i>Operation Unit I</i>
Semester (s) in which the module is taught	2 <sup>nd</sup> semester/1 <sup>st</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. Ir. Umi Rosidah, M.S.</li> <li>2. Dr. Eka Lidiasari, S.TP., M.Si.</li> <li>3. Hermanto S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face lecturer, project, practical
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. describe and calculate the mass and energy balance in the processing of agricultural product</li> <li>2. describe and calculate principles of heat transfer (Conduction, Convection and Radiation) process of agricultural product processing</li> <li>3. describe and calculate the principle of unit operation and Conversion, fluid, size reduction and mixing in the agricultural product industry</li> <li>4. identify the appropriate operating unit and process equipment in the processing of agricultural products</li> <li>5. analyze problems with agricultural products technology approach so that they are efficient and safe.</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: Definition of unit operation; Mass and energy conversion; Mass and energy balance; Dimensions and Units</li> <li>2. Heat Transfer: Conduction; Convection; Radiation; Overall heat transfer; Use of heat transfer</li> <li>3. Drying: Drying principle; The relationship between moisture content and relative humidity.</li> <li>4. Fluid: Static fluid; Dynamic fluid; Type of fluid flow (laminar, turbulent); Reynolds number; Pressure drop in pipe</li> <li>5. Size Reduction: Crushing and cutting; Emulsification or atomization</li> <li>6. Mixing: statistical approach and sample analysis in studying the mixing process; mixing liquid and particulate matter; mixing rate.</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Calculating Assignments</li> <li>2. Essay exams</li> <li>3. Presentation on project</li> </ol>

Reading List

1. Heldman and Singh. 1990. Food Process Engineering. AVI Book Publishing. Connecticut
2. Henderson, S.M. and Perry, R.L. 1976. Agricultural Process Engineering The AVI Publishing Company, Wesport, Connecticut.
3. Earle, R.L. 1980. Unit Operation in Food Processing. Pergamun Press. New York.

Module designation	<i>Islamic Religion</i>
Semester (s) in which the module is taught	2 <sup>nd</sup> semester/1 <sup>st</sup> year
Person responsible for the module	Dr. Nurhasan, M.Ag dan Islamic Religion Team Teaching
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lecture, and project
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. describe, explain about the introduction of Islamic Religious Education</li> <li>2. explain the meaning, the philosophy of divinity in Islam, the history of human thought about God, God according to religion</li> <li>3. explain the meaning, the philosophy of divinity in Islam, the history of human thought about God, God according to religion</li> <li>4. describe and explain the implementation of Faith and Taqwa, Explaining Problems, challenges and risks in modern life the role of Faith and Taqwa in Answering the Challenges of Modern Life</li> <li>5. describe, explain about humans according to Islam</li> <li>6. describe, explain the concept of Law, HAM, Democracy in Islam</li> <li>7. describe, explain the concept of Islamic law, the Contribution of Muslims in Indonesia</li> <li>8. describe, explain how to apply al-Karimah's morals in daily life</li> <li>9. describe, explain concept of science, technology and art in Islam</li> <li>10. describe, explain concept of religious harmony and Civil Society</li> <li>11. describe, explain concept of Islamic Economics and Islamic politics</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction to Religious education</li> <li>2. The Concept of God in Islam</li> <li>3. The concept of faith and piety</li> <li>4. Implementation of Faith and Taqwa in modern life</li> <li>5. Human nature according to Islam</li> <li>6. Law, HAM, and Democracy in Islam</li> <li>7. Islamic Law, Contribution of Muslims in Indonesia</li> <li>8. Moral and Moral Ethics</li> <li>9. Science and technology and art in Islam</li> <li>10. Inter-religious harmony</li> <li>11. Civil Society</li> </ol>

	<ol style="list-style-type: none"><li>12. Islamic Economics</li><li>13. The concept of Islamic culture</li><li>14. Islamic political concept</li></ol>
Examination forms	<ol style="list-style-type: none"><li>1. Essay Assignments</li><li>2. Essay exams</li><li>3. Multiple choice exams</li></ol>
Reading List	<ol style="list-style-type: none"><li>1. Gafur, Abdul and Hasan, Nur (2011) <i>Buku Ajar Mata Kuliah Pengembangan Kepribadian Pendidikan Agama Islam</i>. Percetakan Unsri, Palembang. ISBN 979-587-347-4</li></ol>

Module designation	<i>English</i>
Semester (s) in which the module is taught	2 <sup>nd</sup> semester/1 <sup>st</sup> year
Person responsible for the module	Dra. Zuraida M.Pd and English Team Teaching
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lecture, and project
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understanding and developing grammar structure to make an effective English sentence</li> <li>2. understanding and developing good paragraph</li> <li>3. understanding and developing Reading: strategies and application</li> <li>4. understanding and developing listening to talks and note taking</li> <li>5. understanding and developing academic presentation and discussion</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction and study agreement</li> <li>2. Pronoun Referents</li> <li>3. Adjective clause</li> <li>4. use of words in sentences</li> <li>5. Modifier Problems in sentences</li> <li>6. Subject and predicate in sentences</li> <li>7. Implied main idea</li> <li>8. Making inference and drawing conclusion</li> <li>9. Reading practices</li> <li>10. Strategy for reading and Scientific learning</li> <li>11. Specific information from spoken paragraph</li> <li>12. Listening Practices</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay exams</li> <li>2. Multiple choice exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Loeneto, B.A., Wijaya.A., Kurniawan, D., Zuraida, Suganda, Lingga, A., 2019. English Proficiency Training for use only by students of Sriwijaya University, Language Institute Sriwijaya University, Palembang</li> </ol>

Module designation	<i>Civics</i>
Semester (s) in which the module is taught	2 <sup>nd</sup> semester/1 <sup>st</sup> year
Person responsible for the module	Dr. LR Retno Susanti, M. Hum dan Civics Team Teaching
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lecture, and project
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the important background, concepts, goals, vision, mission and foundation of Civic Education.</li> <li>2. describe the history of the formation of the Indonesian nation; able to formulate the characteristics of national identity; able to identify the factors causing the fading of national identity</li> <li>3. describe concepts, urgency, the nature of national integration and be able to identify the factors forming national integration</li> <li>4. have the ability to explain the meaning of the elements and goals of the State ; Definition, constitutional function; Outlining the constitution of the State of Indonesia; Explaining the amendment UUD 1945.</li> <li>5. understand the existing rules of the Indonesian constitution; explain the obligations and rights of citizens; analyze the rights and obligations of citizens in the life of society, nation and state</li> <li>6. explain the history of the growth and development of democratic ideas/thoughts; analyze various influential variables in the development of democracy; analyze the foundation of democracy in Indonesia and describe the history of the development of democracy in Indonesia</li> <li>7. explain basic concepts/definitions <i>Rule of Law</i> and analyze problems <i>Rule of law</i>.</li> <li>8. explain the history of development HAM and describe various HAM as well as institutions HAM.</li> <li>9. explain the concept of geopolitics as a national insight</li> <li>10. describe the influence of regional and social aspects on existence; analyze the problems of the archipelago's insight in facing the times</li> <li>11. explain the concept of Indonesian Geostrategy in the form of national resilience</li> </ol>

	12. explain the background of the importance of national resilience and describe the main ideas and nature of national resilience in Pancasila and UUD 1945.
Content	<ol style="list-style-type: none"> <li>1. Concept, Purpose, Vision, Mission and Background importance of Civics Education</li> <li>2. National Identity</li> <li>3. National Integration</li> <li>4. The State and Constitution of Indonesia</li> <li>5. The Constitution of Indonesia as a Nation-State</li> <li>6. Rights and obligations of citizens</li> <li>7. Indonesian Democracy</li> <li>8. Law enforcement and HAM</li> <li>9. Archipelago Insights/ Geopolitics.</li> <li>10. Gestrategis Indonesia/ National Resilience</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay assignments</li> <li>2. Essay exams</li> <li>3. Multiple choice exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Buku Modul PKN 2014, Ditjen Pembelajaran dan Kemahasiswaan Kementerian Pendidikan dan Kebudayaan.</li> <li>2. UUD 1945 pasca amandeman</li> </ol>

Module designation	<i>Organic Chemistry</i>
Semester (s) in which the module is taught	2 <sup>nd</sup> semester/1 <sup>st</sup> year
Person responsible for the module	Drs. Dasril Basir, M.Si. and Organic Chemistry team teaching
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lecture, project and practical
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. formulate, show and demonstrate the structure and reactions and reactivity of organic compounds</li> <li>2. explain and apply the relation of chemical reactions to the mechanism of damage and shelf life of food/agricultural products</li> <li>3. analyze and present alkanes, alkenes, alkynes, alcohols, ethers, aldehydes, ketones, carboxylic acids, esters, aromatic compounds, organic halogen compounds, stereochemistry, polymers. Reactions in organic molecules</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction / Introduction to Organic Chemistry</li> <li>2. Classification of organic compounds and nomenclature</li> <li>3. Hydrocarbons: alkanes, alkenes, alkynes</li> <li>4. Aromatic compounds</li> <li>5. Alkyl halides</li> <li>6. Alcohol and ether</li> <li>7. Aldehydes and ketones</li> <li>8. Carboxylic acids and their derivatives (acid halides and esters; anhydrides, amides and nitriles)</li> <li>9. Amina</li> <li>10. Carbohydrates</li> <li>11. Amino acids and proteins</li> <li>12. Lipids</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay exams</li> <li>2. Multiple choice exams</li> <li>3. Practical works</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. R.J.Fessenden, R.J., Fessenden, J.S., Pudjaatmaka, A.H. (1986). Kimia Organik, (terjemahan dari Organic Chemistry, 3rd Edition), Erlangga, Jakarta.</li> </ol>



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|  | <ol style="list-style-type: none"><li>2. R.J.Fessenden, R.J., Fessenden, J.S., Maun, S. (1997). Dasar-Dasar Kimia Organik, (terjemahan dari Fundamentals of Organic Chemistry), Binarupa Aksara, Jakarta</li><li>3. Charles W. Keenan, 1999, Kimia untuk Universitas, Edisi Keenam- Jilid 1 dan 2 (Terjemahan: Aloysius Hadyana Pudjaatmaka), Erlangga, Jakarta</li></ol> |
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Module designation	<i>Statistics</i>
Semester (s) in which the module is taught	2 <sup>nd</sup> semester/1 <sup>st</sup> year
Person responsible for the module	1. Prof . Dr. Ir. Amin Rejo, MP 2. Dr. Budi Santoso, S.TP.,M.Si.
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lecture, project and respons
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Mathematics</i>
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. explain the general concept of statistics and identify the data scale of the variables</li> <li>2. explain the measurement scale, select, collect, calculate and process research data</li> <li>3. Practicing data presentation in a textular, tabular, and graphical way</li> <li>4. arrange random data into grouped data (frequency distribution): Definition of Frequency distribution. Frequency distribution parts; Frequency distribution arrangement; Histograms, frequency polygons, and curves; Type of frequency distribution (student t distribution, chisquare)</li> <li>5. calculate further data that can represent the entire value in the data: Definition of central value measures, Types of center value measures, Calculation of Mean, Median and Mode</li> <li>6. understand the measure of variation or measure of deviation: Descriptive Statistical Measurement, Middle Tendency, Distribution, Position measurement</li> <li>7. calculated and describe the test of Linear regression, correlation and regression analysis and interpret the test results.</li> <li>8. Students are able to perform statistical tests from a sample data from the population and make decisions based on statistical values</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction to Statistical Theory; Data and Variables</li> <li>2. Measurement Scale; Data Collection and Processing</li> <li>3. Data Presentation</li> <li>4. Frequency Distribution</li> <li>5. Centering Size</li> <li>6. Size Variation or Dispersion</li> <li>7. Correlation and regression analysis</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Calculating assignments</li> <li>2. Essay exams</li> <li>3. Multiple choice exams</li> </ol>

Reading List

1. Walpole, R.E. 1995. Pengantar Statistika. Gramedia Pustaka Utama, Jakarta.
2. Nasoetion, A.H. dan Barizi. 1980. METODE STATISTIKA: untuk penarikan kesimpulan. PT. Gramedia, Jakarta.

Module designation	<i>Calculus</i>
Semester (s) in which the module is taught	2 <sup>nd</sup> semester/1 <sup>st</sup> year
Person responsible for the module	1. Prof. Ir. Filli Pratama, M.Sc., (Hons), Ph.D. 2. Prof. Dr. Ir. Tamrin Latief, M.Si.
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lecture, project and respons
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Mathematics</i>
Module objectives/intended learning outcomes	After completing the course, students will be able to: <ol style="list-style-type: none"> <li>1. understand information of calculus course material and objectives of learning these calculus course material especially in agricultural product technology field of study</li> <li>2. understand the calculus material of functions, logarithmic functions, implicit functions, parametric equations and trigonometric functions</li> <li>3. understand the calculus material of partial differential, small increment, change rate, variable replacement</li> <li>4. understand the calculus material of standard integrals, functions of linear functions and special form integrals.</li> <li>5. calculate and apply calculations under and between the curve</li> <li>6. calculate and apply calculations volume of rotary objects for the calculation of the volume of agricultural products.</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction (definition, scope, course contract), standard differential coefficients, differential multiplication and division</li> <li>2. Functions of functions, logarithmic functions, implicit functions and parametric equations</li> <li>3. Trigonometric functions</li> <li>4. Small incremental partial differential, rate of change, variable replacement</li> <li>5. Standard integrals, functions of linear functions and special integrals</li> <li>6. Division integral, integral with partial fractions</li> <li>7. Area under and between curves with integration</li> <li>8. Application of area under and between curves with integration</li> <li>9. Volume of a solid revolution by integration</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Calculating assignments</li> <li>2. Essay exams</li> <li>3. Multiple choice exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Herman, E.D., Strang, G. 2018. Calculus. Volume 1. Rice University. 873 pages</li> <li>2. Strang, G. 1991. Calculus. Wellesley-Cambridge Press. 671 pages</li> </ol>

Module designation	<i>Physical Chemistry</i>
Semester (s) in which the module is taught	3 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Hermanto S.TP., M.Si.</li> <li>2. Dr. Eka Lidasari, S.TP., M.Si.</li> <li>3. Friska Syaiful, S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face lecture, e Learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the courses, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the scope of physical chemistry and the use of physical chemistry in food technology</li> <li>2. understand and recognize the structure of liquids, surface tension, vapor pressure, viscosity, gas laws, gas mixtures, gas specific gravity, gas diffusion, solubility of gases in liquids and theoretical approaches to gas properties.</li> <li>3. understand the meaning and examples of non-electrolyte solutions.and calculations the non-electrolyte exercise.</li> <li>4. understand the meaning and examples of electrolyte solutions.and calculations that electrolyte exercise.</li> <li>5. understand the meaning of colloids, surface and liquid-gas, liquid-liquid, gas-solid and solid-liquid surface chemistry.and analyze calculations colloids, surface chemistry and liquid-gas, liquid-liquid, gas-solid and solid-liquid surface chemistry.</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction to Physical Chemistry</li> <li>2. Properties of Liquids, Solids and Gases</li> <li>3. Non Electrolyte Solution</li> <li>4. Electrolyte Solution</li> <li>5. Reaction Kinetics</li> <li>6. Colloids and Surface Chemistry</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Assignments</li> <li>2. Write essays</li> <li>3. Multiple choice questions</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Bird, T. 1987. Kimia Fisik Untuk Universitas. PT. Gramedia, Jakarta.</li> <li>2. Dogra, S.K. dan S. Dogra. 2008. Kimia Fisik &amp; Soal-soal. UI Press, Jakarta.</li> <li>3. Atkins, P.W. 1994. Kimia Fisika (jilid 1). Erlangga, Jakarta.</li> <li>4. Sukardjo. 1985. Kimia Fisika. Bina Aksara, Yogyakarta.</li> </ol>

Module designation	<i>Biochemistry I</i>
Semester (s) in which the module is taught	3 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. rer.nat. Ir. Agus Wijaya, M.Si.</li> <li>2. Ir. Nura Malahayati, M.Sc., Ph.D.</li> <li>3. Dr. Ir. Anny Yanuriati, M.Appl.Sc.</li> <li>4. Sugito, S.TP., MSi.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Inorganic Chemistry; Organic Chemistry</i>
Module objectives/intended learning outcomes	<p>After completing the courses, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand how biological molecules give rise to the processes that occur between living cells and between cells</li> <li>2. explain structure and function of cells</li> <li>3. explain chemistry of water, bases, acids and buffers</li> <li>4. explain classification, structure, and function of carbohydrate, protein, lipid, nucleic acid and enzyme</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: The scope of Biochemistry, as well as its relation to other fields of science within the scope of food technology</li> <li>2. Biochemistry and Life: Biochemistry and life theory, energetic; Energy and food; Life cycle</li> <li>3. Cell: Cell structure; Animal cells and plant cells; Organelles and their biochemical functions; Tissues and organs</li> <li>4. Body fluids: Intracellular fluid; Extracellular fluid; Body's acid base balance; Electrolyte; Body fluids and biochemical reactions</li> <li>5. Carbohydrate: Definition of carbohydrates; Classification of carbohydrates by monomer; Monosaccharides and their names; Classification of aldose and ketose; Structure of D, L, <math>\alpha/\beta</math>; Reducing and non reducing sugar; Glycosidic bond; Disaccharides; Polysaccharides</li> <li>6. Lipids: Definition of lipid; The benefits of lipids in food and the body; Naming of fatty acids; Saturated and unsaturated fat; Triglycerides; Phospholipids; Sphingolipids; Glycolipid; Lipids and cell membranes; Lipids without fatty acids</li> <li>7. Protein: Definition of protein; Functions of protein in the body; Basic structure of amino acids; Classification of amino acids based on the R group (polar and nonpolar, aromatic, charged amino acids); Peptide bond; Protein structure; Protein side chain bonds</li> <li>8. Nucleic acid: Definition; DNA as genetic material; Nitrogenous bases, nucleotides and nucleosides; Genetic elements; DNA Structure</li> </ol>

	9. Enzyme: Definition; Enzyme scope; Proteins as enzymes; Enzyme basic structure; Enzyme Classification; Enzyme naming; Enzymes as reaction catalysts; Cofactors and coenzymes; Types of enzymatic reactions
Examination forms	1. Multiple choice exams 2. Practical works
Reading List	1. Koolman, J. and Roehm, K.-H. 2005. Color Atlas of Biochemistry. 2nd edition. Thieme, Stuttgart, Germany. 2. Nelson, D.L. and Cox, M.M. 2004. Lehninger Principles of Biochemistry. 4th ed. W.H. Freeman and Co.

Module designation	<i>General Microbiology</i>
Semester (s) in which the module is taught	3 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. rer.nat. Ir. Agus Wijaya, M.Si.</li> <li>2. Dr. Ir. Tri Wardani Widowati, M.P.</li> <li>3. Dr. Ir. Parwiyanti, M.P.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face learning, e Learning, Videos
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the courses, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand and be able to explain the history of microbiology, structural differences between prokaryote and eukaryote cells, sporulation, germination and sublethal injury</li> <li>2. understand and be able to explain the morphological, physiological and isolation and identification methods differences among bacteria, yeast and mold</li> <li>3. understand and be able to explain the growth, influencing factors of growth, nutrient transport mechanisms and metabolism in microorganisms</li> <li>4. understand and be able to explain special mechanism in microorganism in order to survive the adverse environmental condition, including antibiotics</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. History and development of microbiology</li> <li>2. Identification of prokaryote and eukaryote cells</li> <li>3. Bacteria: morphology and physiology</li> <li>4. Isolation, identification and nomenclature of microorganism</li> <li>5. Sporulation, Germination and Sublethal injury</li> <li>6. Yeasts: morphology and physiology</li> <li>7. Molds: morphology and physiology</li> <li>8. Curve of Microbial growth</li> <li>9. Intrinsic and extrinsic factors of microbial growth</li> <li>10. Membrane system and nutrient transport</li> <li>11. Microbial metabolism</li> <li>12. Antibiotics: mode of action and microbial resistance</li> <li>13. Microbial communication</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essays exams</li> <li>2. Multiple choice exams</li> <li>3. Practical works</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Madigan, M.T., Martinko, J.M. and Parker, J. 2003. Brock Biology of Microorganisms. 10th ed. Prentice Hall. New Jersey.</li> </ol>



Module designation	Material Science	
Semester (s) in which the module is taught	3 <sup>th</sup> semester/2 <sup>nd</sup> year	
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. Ir. Gatot Priyanto, M.S.</li> <li>2. Dr. Ir. Parwiyanti, M.Si</li> <li>3. Dr. Budi Santoso, S.TP.,M. Si.</li> <li>4. Dr. Merynda Indriyani Syafutri, S.TP., M.Si.</li> <li>5. Friska Syaiful, S.TP., M.Si</li> </ol>	
Language	Indonesian	
Relation to curriculum	Compulsory Course	
Type of teaching, contact hours	<ul style="list-style-type: none"> <li>-Face-to-face lecture (offline) and E-Learning (online)</li> <li>-The class size 20-75 students per class</li> <li>-Contact hours for lecture are 51.33 hours per semester</li> <li>-Total hours practical is 19.83 hours per semester</li> </ul>	
Workload (incl. Contact hours, self-study hours)	<ol style="list-style-type: none"> <li>1. Lectures (2 x 50 minutes) per week or 51.33 hours per semester</li> <li>2. Self-study: 2 x 60 minutes per week or 24 hours per semester</li> </ol>	
Credit points	3 credits (equivalent with 4.8 ECTS)	
Required and recommended prerequisite for joining the module	A student must have attended the lecture at least 85% of total lectures and submitted all the assignments prior to join the final exam	
Module objectives/intended learning outcomes	After completing this course, a student is expected to:	
	<b>CLO1</b>	Understand definition and function of knowledge of agricultural products.
	<b>CLO2</b>	Understand physical and chemical characteristics of agricultural products (fruits, vegetables, cereals, legumes, tubers, egg, fishery products, meat, milk, plantation products, vegetable oils, and spices) as raw materials in food industry.
	<b>CLO3</b>	understand physical and chemical changes of agricultural products postharvest.
	<b>CLO4</b>	understand the mechanism of damage to agricultural products and identify how to control it
Content	<ol style="list-style-type: none"> <li>1. Introduction: Definition and function of knowledge of agricultural products</li> <li>2. Physical and chemical characteristics of fruits and vegetables and alternative processed products.</li> <li>3. Changes in the physical and chemical properties of fruits and vegetables during ripening.</li> <li>4. Physical and chemical characteristics of cereals and legumes and their alternative products.</li> <li>5. Physical and chemical characteristics of tubers and alternative processed products.</li> <li>6. Physical, chemical and microorganism properties and their relationship to the quality of milk and dairy products</li> </ol>	

	<ol style="list-style-type: none"> <li>7. Egg structure, composition, physicochemistry as a determinant of egg quality and post-harvest and egg preservation and their processed products</li> <li>8. Characteristics of fishery products and factors determining fish quality.</li> <li>9. Changes in post-harvest fish and handling of fresh fish</li> <li>10. Structure, composition and determinants of meat quality as well as physiological and physical changes in meat after slaughter and post-mortem processes</li> <li>11. Definition and classification of plantation products, physical and chemical characteristics of plantation products and some of the main products of plantation products</li> <li>12. Classification of oil-producing vegetable foods and the physical and chemical characteristics of vegetable oils</li> <li>13. Physical and chemical characteristics of spices and their use in the food industry</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay exams</li> <li>2. Multiple choice exams</li> <li>3. Practical works</li> </ol>
Media employed	LCD, whiteboard, E-learning, videos
Reading List	<ol style="list-style-type: none"> <li>1. Peter, K. V. 2004. Handbook of Herbs and Spices. CRC Press LLC. Boca Raton FL 33431. USA.</li> <li>2. Sinha, N.K., Y.H. Hui, and M.S. J. Ahmed. 2011. Handbook of vegetables and vegetable processing. Blackwell Publishing Ltd. Ames, Iowa 50014, USA.</li> <li>3. Owen, G. 2000. Cereals Processing Technology. CRC Press LLC. Boca Raton FL 33431.</li> <li>4. Haryati. 2015. Rempah-rempah dan Bahan Penyegar. Teknologi Agroindustri. Universitas Pendidikan Indonesia.</li> <li>5. Rinto dan Wulandari. 2020. Modul Ajar: Dasar-dasar Teknologi Hasil Perikanan. Fakultas Pertanian. Universitas Sriwijaya.</li> <li>6. Irianto HE dan Giyatmi S. Modul Prinsip Dasar Teknologi Pengolahan Hasil Perikanan.</li> <li>7. Walstra P. 1999. Dairy Technology: Principle of Milk Properties and Processes.</li> <li>8. Jurnal-jurnal Nasional dan Internasional.</li> </ol>

Module designation	<i>Operation Unit II</i>
Semester (s) in which the module is taught	3 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	1. Dr. Ir. Umi Rosidah, M.S. 2. Dr. Eka Lidiasari, S.TP., M.Si. 3. Hermanto S.TP., M.Si.
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Operation Unit I</i>
Module objectives/intended learning outcomes	After completing the course, students will be able to: 1. describe and calculate principles of moisture content of materials 2. understand and calculate in grain drying, evaporation, cooling, and separation process 3. describe and calculate the viscosity and consistency of fluid food.
Content	1. Moisture content of materials 2. Grain drying: Drying air properties; Use of Psychometric Charts; Sensible cooling and heating; Air mixing; Heating and humidifying; Cooling and dehumidification; Drying 3. Rheology: Viscosity and consistency; Stress-strain treatment in materials; Newtonian and non-Newtonian; Rheological models (Bingham plastic, pseudoplastic, newtonian, dilatant); Measurement of rheological parameters 4. Evaporation; Calculate the heat transfer process in evaporation; Complete calculations in the evaporation process on heat sensitive materials 5. Cooling: Refrigeration; Thermodynamics and the refrigeration cycle on the pressure-enthalpy diagram; Solve problems using the refrigeration diagram 6. Separation Process
Examination forms	1. Calculating Assignments 2. Essay exams
Reading List	1. Heldman and Singh. 1990. Food Process Engineering. AVI Book Publishing. Connecticut 2. Henderson, S.M. and Perry, R.L. 1976. Agricultural Process Engineering The AVI Publishing Company, Westport, Connecticut. 3. Earle, R.L. 1980. Unit Operation in Food Processing. Pergamon Press. New York.

Module designation	<i>Agricultural Product Chemistry</i>	
Semester (s) in which the module is taught	3 <sup>th</sup> semester/2 <sup>nd</sup> year	
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Prof. Dr. Ir. Basuni Hamzah, M.Sc.</li> <li>2. Prof. Ir. Filli Pratama, M.Sc., (Hons), Ph.D.</li> <li>3. Sugito, S.TP., M.Si.</li> </ol>	
Language	Indonesian	
Relation to curriculum	Compulsory Course	
Type of teaching, contact hours	<ul style="list-style-type: none"> <li>-Lectures (explanation, discussion)</li> <li>-Structured assignment (i.e.: article reading and review)</li> <li>-The class size 30-70 students per class</li> <li>-Contact hours for lecture are 51.33 hours per semester</li> <li>-Total hours practical is 19.83 hours per semester</li> </ul>	
Workload (incl. Contact hours, self-study hours)	<ol style="list-style-type: none"> <li>1. Lectures (2 x 50 minutes) per week or 51.33 hours per semester</li> <li>2. Structured assignment (i.e.: article reading and review): 2 x 60 minutes per week or 24 hours per semester</li> <li>3. Self-study: 2 x 60 minutes per week or 24 hours per semester</li> </ol>	
Credit points	3 credits (equivalent with 4.8 ECTS)	
Requirements according to the examination regulations	A student must have attended the lecture at least 85% of total lectures and submitted all the assignments prior to join the final exam	
Module objectives/intended learning outcomes	After completing this course, a student is expected to:	
	<b>CLO1</b>	understand and be able to explain the properties of major and minor components as well as the functional components in agricultural products
	<b>CLO2</b>	understand and be able to explain the cause-and-effect relationship of food components pertaining to food alteration during handling, processing and storage
	<b>CLO3</b>	understand and be able to explain the reaction relating to damage mechanism
	<b>CLO4</b>	understand and be able to explain the changes properties of the major, minor and functional components in agricultural product as affected by external factors
Content	<ol style="list-style-type: none"> <li>1. Introduction and scope area in agricultural products (macro- and micro-chemical components, functional)</li> <li>2. Water properties and water activity, and its effect on agricultural product's quality</li> <li>3. Fat/Oil properties and its effects on agricultural product's quality</li> <li>4. Emulsifier and HLB (hydrophilic and Lipophilic Balance) calculations</li> <li>5. Carbohydrate properties</li> <li>6. Carbohydrate's derivatives and its application</li> <li>7. Protein properties</li> <li>8. Enzyme properties and controlling enzyme activity</li> <li>9. Food additives</li> <li>10. Phytochemical compounds</li> <li>11. Flavor for foods and drinks</li> </ol>	

Examination forms	<ol style="list-style-type: none"><li>1. Quiz, Assignment</li><li>2. Mid-terms and Final Examination,</li><li>3. Practical Works,</li></ol>
Media employed	LCD, whiteboard, websites
Reading List	<ol style="list-style-type: none"><li>1. Belitz, H.D.; Grosch, W.; Schieberle, P. 2009. Food Chemistry. 4<sup>th</sup> Revised and Extended Ed. Springer-Verlag-Berlin Heidelberg. 1114 pages</li><li>2. Damodaran, S.; Parkin K.L. 2017. Fennema's Food Chemistry. 5<sup>th</sup> edition. CRC Press Taylor &amp; Francis Group. 1125 pages.</li></ol>

Module designation	<i>Experimental Design</i>
Semester (s) in which the module is taught	3 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	1. Prof. Dr. Ir. Amin Rejo, M.P. 2. Hermanto, S.TP, M.Si.
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Contextual Learning, Cooperative learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Statistics</i>
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. know the difference between experimental and experimental design and between environmental design and treatment design</li> <li>2. understand the meaning of non-factorial design and the designs included in it.</li> <li>3. understand the meaning of factorial design and the designs included in it</li> <li>4. understand the mean difference test of the effect of treatment and treatment group</li> <li>5. understand experiments that have problematic data (lost data and data transformation)</li> <li>6. understand covariance analysis</li> <li>7. understand regression and correlation</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Definition of experiment and experimental design</li> <li>2. Understanding environmental design and treatment design</li> <li>3. Complete Random Design, Randomized Block Design, Latin Square Design, split plot design and strip plot design.</li> <li>4. Mean difference test effect of treatment (Dunnnett, Least Significance Different, Tukey Test, Duncan Multiple Range test</li> <li>5. Contrast and polynomial orthogonal method</li> <li>6. Definition of factorial experiment, Notation in factorial experiment, Analysis of variance (variance test), and conclusions.</li> <li>7. Common causes of data loss, The technique of missing data formulas, Data transformation</li> <li>8. Benefits of analysis of covariance, Covariance analysis procedure, Missing data technique using covariance, Simple linear or nonlinear regression and correlation, Multiple linear or nonlinear regression and correlation, Looking for the best regression</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Calculating Assignments</li> <li>2. Essay exams</li> </ol>

Reading List

1. K.A. Gomez. A.A. Gomez. 1976. Statistical procedures for agricultural research with emphasis on rice. The International Rice Research Institute. Los Banos. Laguna. Philippines.
2. Robert G.D Steel and J.H. Torrie. 1960. Principles and Procedures of Statistics with Special Reference to the Biological Sciences. McGraw-Hill Book Company, Inc. New York.

Module designation	<i>Agribusiness Communication</i>
Semester (s) in which the module is taught	3 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. Riswani, S.P., M.Si.</li> <li>2. Dr. Yunita, S.P., M.Si.</li> <li>3. Elly Rosana, S.P., M.Si.</li> <li>4. M. Arbi, S.P., M.Si.</li> <li>5. Selly Oktarina, S.P., M.Si.</li> <li>6. Thirtawati, S.P., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Contextual Learning, Cooperative learning, Project-Based Learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Synchronous Study; 120 minutes for structured academic assignment; 120 minutes for self-study per week; 100 minutes for the final project (170 x 3 credits)
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. have good morals, ethics, and personality in completing their duties</li> <li>2. work together and have social sensitivity and high concern for society and the environment</li> <li>3. understand the fields of economics, management, business, entrepreneurship, institutions, sociology, counseling, and communication as well as agricultural sciences for the development of sustainable agribusiness operation systems.</li> <li>4. understand operationally the principles of using information technology and multimedia that underlie the management of agricultural businesses and the agricultural industry for decision making and problem-solving in the field of agribusiness by utilizing information technology</li> <li>5. understand and apply the role of communication in the agribusiness system</li> <li>6. use media and communication information technology applied in every agribusiness sub-system</li> <li>7. design effective communication strategies in agribusiness development</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: Understanding, Basic Principles and Scope of Agribusiness Communication</li> <li>2. Effective Communication</li> <li>3. Agribusiness Communication Methods and Media</li> <li>4. Principles and Barriers to Communication</li> <li>5. Communication Applications in Agribusiness Product Marketing</li> <li>6. Product Packaging</li> <li>7. Market Display and Pricing Strategy</li> <li>8. Digital Content in Agribusiness</li> <li>9. Digital Content creation practices</li> </ol>



	<ol style="list-style-type: none"> <li>10. Digital Marketing</li> <li>11. Digital Marketing Practices on Agricultural Products</li> <li>12. Negotiating in Agribusiness Communication</li> <li>13. Business Message Plannin</li> <li>14. Public Relation in Agribusiness</li> <li>15. Final Project</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essays exams</li> <li>2. Practical works</li> <li>3. Video/Movie/Digital Content Project</li> <li>4. Oral presentation</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Jalaluddin Rakhmat; 2007, Psikologi Komunikasi;</li> <li>2. Dedy Mulyana; 2005, Ilmu Komunikasi: Suatu Pengantar;</li> <li>3. De Vito, J.A. 1997. Komunikasi Antar Manusia. (Alih Bahasa Agus Maulana) Jakarta: Professional Books 3.</li> <li>4. Tubbs, S.L. dan S. Moss. 1997. Human Communication. Jilid 1 dan 2. (Diterjemahkan oleh Jalaludin Rakhmat) Bandung: Remaja Rosda Karya.</li> </ol>

Module designation	<i>Biochemistry II</i>
Semester (s) in which the module is taught	4 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. rer.nat. Ir. Agus Wijaya, M.Si.</li> <li>2. Ir. Nura Malahayati, M.Sc., Ph.D.</li> <li>3. Dr. Ir. Anny Yanuriati, M.Appl.Sc.</li> <li>4. Sugito, S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning, Videos
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	<i>Biochemistry I</i>
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. explain carbohydrate metabolism</li> <li>2. explain alternative metabolism</li> <li>3. explain protein metabolism</li> <li>4. explain lipid metabolism</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: Metabolism; Catabolism; Anabolism; The link between metabolism and food technology</li> <li>2. Bioenergetics, Digestion and absorption Energy transfer: ATP; Digestive process; Absorption of nutrients in the body</li> <li>3. Glycolysis; Enzymes and ATP from glycolysis; Regulation of the process of glycolysis; Alcoholic fermentation; ATP from the fermentation process</li> <li>4. TCA Cycle: The series of processes of the Krebs Cycle; Kreb's Cycle ATP Calculation; Kreb's Cycle Enzymes; Regulation in the Kreb's Cycle</li> <li>5. Oxidative Phosphorylation/Electron Transport: Electron transfer; Oxidative Phosphorylation; ATP production; Regulation of respiration</li> <li>6. Alternative metabolism/rescue pathway: Glycogenesis; Glycogenolysis; Gluconeogenesis; Pentose Phosphate Pathway; HMP pathway.</li> <li>7. Protein Catabolism: Deamination and transamination; Protein catabolism into ATP; Protein catabolism into intermediates; Urea cycle.</li> <li>8. Protein Anabolism: Formation of peptides; Formation of non-essential amino acids; Protein formation; Regulation of protein anabolism</li> <li>9. Lipid Catabolism: <math>\beta</math>-oxidation of fatty acids in general; Energy <math>\beta</math>-oxidation; <math>\beta</math>-oxidation of double-chain and C-odd fatty acids</li> </ol>

	10. Lipid Anabolism: Energy of fat anabolism; Biosynthesis in denovo; Elongation; Desaturation; Biosynthesis of special fatty acids
Examination forms	<ol style="list-style-type: none"><li>1. Essay Assignments</li><li>2. Multiple choice exams</li></ol>
Reading List	<ol style="list-style-type: none"><li>1. Koolman, J. and Roehm, K.-H. 2005. Color Atlas of Biochemistry. Thieme, Stuttgart, Germany.</li><li>2. Nelson, D.L. and Cox, M.M. 2004. Lehninger Principles of Biochemistry, 4th ed. W.H. Freeman and Co.</li></ol>

Module designation	<i>Hygiene, Sanitation and Food Industry Safety</i>
Semester (s) in which the module is taught	4 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	1. Dr. rer.nat. Ir. Agus Wijaya, M.Si. 2. Dr. Ir. Tri Wardani Widowati, M.P.
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning, Videos
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>General Microbiology</i>
Module objectives /intended learning outcomes	After completing the course, students will be able to: <ol style="list-style-type: none"> <li>1. explain sort and sources of contamination and factors that affect contamination</li> <li>2. explain hygiene and sanitation of environment, raw materials and supporting materials, equipments, finished product and waste.</li> <li>3. explain methods of equipments cleaning</li> <li>4. explain safety, comfort, hygiene and sanitation of food handlers</li> <li>5. explain Hazard Analysis and Critical Control Points</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction (including definition of hygiene, sanitation and safety in food industry)</li> <li>2. Sort and sources of contamination</li> <li>3. Factors influencing contamination</li> <li>4. Hygiene and sanitation of environment</li> <li>5. Hazard Analysis and Critical Control Points</li> <li>6. Hygiene and sanitation on raw materials</li> <li>7. Hygiene and sanitation on supporting materials</li> <li>8. Hygiene and sanitation of equipments</li> <li>9. Methods of equipments cleaning</li> <li>10. Hygiene and sanitation on food handlers</li> <li>11. Safety for food handler</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Multiple choice exams</li> <li>3. Practical works</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Forsythe, S.J. and Hayes, P.R. 2010.. Food Hygiene, Microbiology and HACCP. 3rd ed. Aspen publishers, Inc.</li> <li>2. Lelieveld, H.L.M., Mostert, M.A., Holah, J. and White, B. 2003. Hygiene in Food Processing. CRC Press.</li> <li>3. Marriott, N.G. and Gravani, R.B. 2006. Principles of Food Sanitation. 5th edition. Springer.</li> </ol>

Module designation	<i>Food and Processing Microbiology</i>
Semester (s) in which the module is taught	4 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. rer.nat. Ir. Agus Wijaya, M.Si.</li> <li>2. Prof. Dr. Ir. Basuni Hamzah, M.Sc.</li> <li>3. Dr. Ir. Tri Wardani Widowati, M.P.</li> <li>4. Dr. Ir. Parwiyanti, M.P.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning, Videos
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>General Microbiology</i>
Module objectives /intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. describe the principles of preservation and processing of agricultural products by the fermentation process</li> <li>2. identify characteristics of microbial spoilage, sequence of events, understand significance of microbial numbers and how to prevent spoilage.</li> <li>3. determine the cause and the types of food borne diseases and responsible pathogenic microbes.</li> <li>4. explain principles of microbial growth control in food by physical, chemical and novel methods.</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: The importance of microorganism in food</li> <li>2. The use of beneficial bacteria, yeasts, and molds in food</li> <li>3. Food spoilage by bacteria, yeasts and molds</li> <li>4. Microbial foodborne diseases</li> <li>5. Physical microbial growth control in foods (heat, low temperature, low Aw, modified atmosphere, irradiation, novel non thermal tech.)</li> <li>6. Chemical microbial control in foods (organic acids, natural dan synthetic preservatives)</li> <li>7. Microbial control in foods with combination methods (hurdle concept)</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Multiple choice exams</li> <li>3. Practical works</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Ray, B. and Bhunia, A. 2013. Fundamental Food Microbiology. 5th ed. CRC Press, Boca Raton.</li> <li>2. Farnworth, E.R.(Ed.). 2003. Handbook of Fermented Functional Foods. CRC Press. Boca Raton.</li> <li>3. Hutkins, R.W. 2006. Microbiology and Technology of Fermented Foods. Blackwell Publishing. Oxford.</li> </ol>

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|  | 4. Madigan, M.T., Martinko, J.M. and Parker, J. 2003. Brock Biology of Microorganisms. 10th ed. Prentice Hall. New Jersey. |
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Module designation	<i>Principles of Agricultural Products Processing</i>
Semester (s) in which the module is taught	4 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. Ir. Gatot Priyanto, M.P.</li> <li>2. Dr. Ir. Umi Rosidah, M.S.</li> <li>3. Dr. Merynda Indriyani Syafutri, S.TP., M.Si.</li> <li>4. Friska Syaiful, S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Material Science</i>
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the Philosophy and General Concepts of Principles of Agricultural Products Processing</li> <li>2. understand the principle of Food Processing and Agricultural Products</li> <li>3. understand and describe of food processing based on different characteristics of raw materials and ingredients (high-carbohydrate, high oil/fat, high protein materials)</li> <li>4. understand and describe of food processing based on animal products; fish and other marine products; honey, eggs, milk and their derivative products; fiber, fruit and vegetable product.</li> <li>5. describe the principles and techniques of handling and processing agricultural products such as semimoist food product, extrusion product, effervescent product, encapsulation product</li> <li>6. understand and describe of specific food handling and processing such as food additive, spices and herbs, emulsion inputs/products.</li> <li>7. understand the latest issues in the field of Food Processing and Agricultural Products</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Philosophy and General Concepts of Principles of Agricultural Products Processing</li> <li>2. Principle of Food Processing and Agricultural Products</li> <li>3. High Carbohydrate Based Processing</li> <li>4. High Oil/Fat and High Protein Based Processing</li> <li>5. Processing of Animal Products</li> <li>6. Processing of Fish and Other Marine Products</li> <li>7. Processing of Honey, Eggs, Milk and Derivative Products</li> <li>8. Processing of Fiber, Fruit and Vegetable products</li> <li>9. Handling of Spices and Herbs</li> <li>10. Handling of Additive Food in Processing</li> <li>11. Handling of Emulsion Inputs/Products</li> </ol>

	<ul style="list-style-type: none"> <li>12. Processing of Semimoist Food Product</li> <li>13. Processing of extrusion Product</li> <li>14. Effervescent Product Manufacturing and Encapsulation</li> </ul>
Examination forms	<ul style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Essay exams</li> <li>3. Multiple choice exams</li> <li>4. Practical works</li> </ul>
Reading List	<ul style="list-style-type: none"> <li>1. Owen, G. 2000. Cereals Processing Technology. CRC Press LLC. Boca Raton FL 33431.</li> <li>2. Fellows, P. 2001. Food Processing Technology: Principles and Practice, 2<sup>nd</sup>.Ed. Woodhead Publishing Limited and CRC Press LLC. Boca Raton FL 33431. USA.</li> <li>3. Peter, K. V. 2004. Handbook of Herbs and Spices. CRC Press LLC. Boca Raton FL 33431. USA.</li> <li>4. Smith, J.S. and Y.H. Hul. 200. Food Processing : principles and applications. Blackwell Publishing Ltd., Ames, Iowa 50014, USA</li> <li>5. Branen AL, Davidson PM, Salminen S, dan Thorngate JH. 2002. Food Additives. Marcel Dekker Inc. New York.</li> <li>6. Koswara S. 2009. Teknologi Pengolahan Telur. eBookPangan.com.</li> <li>7. Koswara S. Teknologi Enkapsulasi Flavor Rempah-rempah. eBookPangan.com.</li> <li>8. Kemenkes RI. 2012. Peraturan Menteri Kesehatan RI Nomor 033 Tahun 2012 Tentang Bahan Tambahan Pangan.</li> <li>9. BPOM. 2019. Peraturan Badan Pengawas Obat dan Makanan Nomor 11 Tahun 2019 Tentang Bahan Tambahan Pangan.</li> <li>10. Sobari E dan Tim Agrotek UIN. 2019. Dasar-dasar Proses Pengolahan Bahan Pangan. Polsub Press. Subang.</li> <li>11. Lindriati T dan Handayani S. 2018. Teknologi Ekstrusi dalam Pengolahan Pangan. Caremedia Communication. Gresik.</li> </ul>



Module designation	<i>Sensory Evaluation</i>
Semester (s) in which the module is taught	4 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Prof. Ir. Filli Pratama, M.Sc. (Hons), Ph.D.</li> <li>2. Ir. Nura Malahayati, M.Sc., Ph.D.</li> <li>3. Dr. Ir. Kiki Yuliati, M.Sc.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	----
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the philosophy and general concepts of sensory evaluation course material and the function of the human senses assess product quality.</li> <li>2. learn independently by exploring knowledge through online resources about attributes, perception and requirements in sensory analysis, and determining factors in judging sensory analysis</li> <li>3. understand and describe the role of a panelist as a tool in sensory analysis; panelist classification and method of selection of panelist; requirements to be a panelist</li> <li>4. understand on how to determine threshold and its calculation.</li> <li>5. understand and describe the Classifications of sensory analysis based objectives (discrimination, description and preference); Sensory analysis (discrimination: duo-trio, triangle, two out of five tests); Types of sensory analysis (discrimination: A Not A test, difference from control, paired and multi comparison test)</li> <li>6. understand and describe the hedonic test (method of conduct, questionnaire); calculate the hedonic analysis; conduct a hedonic quality analysis</li> <li>7. understand and conduct the descriptive test and the sensory analysis for children</li> <li>8. understand and apply how to choose the types of sensory analysis for judging the product quality</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction (definition, objectives, scope area, course contract)</li> <li>2. the function and how the human senses assess product quality.</li> <li>3. Attributes, perception and requirements in sensory analysis, and determining factors in judging sensory analysis</li> <li>4. Panelist as a tool in sensory analysis; panelist classification and method of selection of panelist; requirements to be a panelist</li> <li>5. Determining threshold and its calculations</li> <li>6. Classifications of sensory analysis based objectives (discrimination, description and preference)</li> </ol>

	<ol style="list-style-type: none"> <li>7. Sensory analysis (discriminaton: duo-trio, triangle, two out of five tests)</li> <li>8. Types of sensory analysis (discriminaton: A Not A test, difference from control, paired and multi comparison test)</li> <li>9. Hedonic test</li> <li>10. Hedonic Quality test</li> <li>11. Descriptive test</li> <li>12. Sensory analysis for children</li> <li>13. Guidelines for choice of sensory analysis types for judging product quality</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essays exams</li> <li>2. Multiple choice exams</li> <li>3. Practical works</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Lawless, H.T., Heymann, H. 2010. Sensory Evaluation of Food. Principles and Practices. Second Edition. Springer New York. 617 pages.</li> <li>2. Meilgaard, M.C. 2007. Sensory Evaluation technoques. Fourth Edition. CRC Press, Taylor &amp; Francis Group. 466 pages.</li> <li>3. O’Sullivan, M.G. 2017. A Handbook for Sensory and Consumer-Driven New Product Development. Woodhead Publishing. 372 pages.</li> </ol>

Module designation	<i>Agricultural Product Analysis</i>
Semester (s) in which the module is taught	4 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Prof. Ir. Filli Pratama, M.Sc., (Hons), Ph.D.</li> <li>2. Prof. Dr. Ir. Basuni Hamzah, M.Sc.</li> <li>3. Sugito, S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Analytical Chemistry</i>
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand agricultural product analysis course materials and objectives of learning the course material especially in the area of agricultural industry</li> <li>2. provide experiential learning to students independently by exploring knowledge through online resources about the water content and water activity analysis as well as pre-treatment prior to analysis</li> <li>3. understand and describe the methods of crude fat analysis (solid and liquid samples), and oil quality analysis of agricultural products</li> <li>4. understand and describe the methods of color analyze and texture analysis of agricultural products</li> <li>5. understand and describe the methods of total soluble solid analysis and the brix acid ratio analysis in various of food product</li> <li>6. understand and describe the methods of reducing sugars analysis, amino acid analysis, water-soluble vitamins analysis, fat-soluble vitamins analysis, enzyme analysis, antioxidant analysis in various of food product</li> <li>7. understand and describe the extracting technique and phytochemicals screening.</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction (agricultural product's analysis area of scope, objectives and application in agricultural industry)</li> <li>2. Water and ash analysis</li> <li>3. Crude Fat analysis (solid and liquid samples), fat/oil quality analysis</li> <li>4. Color and texture analysis</li> <li>5. Total soluble solid analysis</li> <li>6. Brix acid ratio analysis</li> <li>7. Reducing sugars analysis</li> <li>8. Amino acids analysis</li> <li>9. Enzyme analysis</li> <li>10. Water-soluble vitamins analysis</li> <li>11. Fat-soluble vitamins analysis</li> <li>12. Extracting technique and phytochemical screening</li> </ol>

	13. Antioxidant analysis
Examination forms	<ol style="list-style-type: none"><li>1. Essay exams</li><li>2. Multiple choice exams</li><li>3. Practical works</li></ol>
Reading List	<ol style="list-style-type: none"><li>1. Nielsen, S.S. 2017. Food Analysis Laboratory Manual. 3<sup>rd</sup> Edition. Springer New York Dordrecht Heidelberg London. 242 pages.</li><li>2. Nielsen, S.S. 2010. Food Analysis. 4<sup>th</sup> Edition. Springer New York Dordrecht Heidelberg London. 585 pages.</li><li>3. Otles, S. 2012. Methods of Analysis of Food Components and Additives. 2<sup>nd</sup> Edition. CRC Press Taylor &amp; Francis Group. 528 pages.</li></ol>

Module designation	<i>Food Crops Processing Technology</i>
Semester (s) in which the module is taught	4 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. Ir. Anny Yanuriati, M.Appl.Sc.</li> <li>2. Dr. Ir. Parwiyanti, M.P.</li> <li>3. Dr. Budi Santoso, S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	Material Science
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand and describe characteristics, changes and factors effecting the quality and of raw tubers, cereals and legumes</li> <li>2. describe the principles and techniques of handling and processing of tuber, cereals and as well as the influence of processing on quality, safety and shelf life of tuber, cereal and legumes</li> <li>3. understand current technology development and challenges in processing of tubers, cereals and legumes</li> <li>4. identify the main and current processing technologies used to process tubers, cereals and legumes</li> <li>5. apply their understanding on current processing technologies development and challenges to create innovative products made of tubers, cereals and legumes.</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: Definition, scope, purpose of studying food crop technology: Types of food crop commodities; The types of technology that can be applied in the processing of food crops.</li> <li>2. Sago: varieties, composition, characteristics, postharvest handling, processing technology of sago to starch and innovative product development from sago</li> <li>3. Porang: varieties, composition, characteristics, postharvest handling, processing and innovative product development from glucomannan and starch</li> <li>4. Soybeans: varieties, composition, characteristics, postharvest handling, processing and product development innovative soybean products</li> <li>5. Corn: varieties, composition, characteristics, postharvest handling, processing and product development innovative corn products</li> <li>6. Rice: varieties, composition, characteristics, postharvest handling, processing and product development innovative rice products</li> <li>7. Cassava: varieties, composition, characteristics, postharvest handling, processing and product development innovative cassava product</li> </ol>

	<ol style="list-style-type: none"> <li>8. Ganyong: varieties, composition, characteristics, postharvest handling, processing and product development innovative ganyong products</li> <li>9. Sorgum: varieties, composition, postharvest handling, processing and product development innovative sorghum products</li> <li>10. Gadung: varieties, composition, postharvest handling, processing and product development innovative gadung products</li> <li>11. Discussions related to novel technology processing, product and design some food crops</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Essays exams</li> <li>3. Multiple choice exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Karetro, B. 2017. Teknologi pengolahan dan pangan fungsional kacang-kacangan. Plantasia.</li> <li>2. Szrednicki, G. and Borompichaicharkul. 2020. Konjac glucomannan. Production, processing and functional applications.</li> <li>3. Ehara, H., Toyoda, Y. and Johnson, D.V. 2018. Sago palm. Springer open.</li> <li>4. Salunkhe, D.K. and Kadam, S.S. 2019. Handbook of vegetables science and technology. Marcel Dekker, Inc.</li> </ol>

Module designation	<i>Plantation Crops Processing Technology</i>
Semester (s) in which the module is taught	4 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	1. Dr. Ir. Anny Yanuriati, M.Appl.Sc. 2. Sugito, S.TP., M.Si.
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	After completing the course, students will be able to: <ol style="list-style-type: none"> <li>1. understand and describe characteristics, changes and factors effecting the quality and of raw plantation crop materials (palm, coconut, coffee, tea, sugar, pepper)</li> <li>2. understand and describe the principles and techniques of handling and processing of plantation crop materials (palm, coconut, coffee, tea, sugar, pepper)</li> <li>3. understand current technology development and challenges in processing of plantation crop materials (palm, coconut, coffee, tea, sugar, pepper)</li> <li>4. apply their understanding on current processing technologies development and challenges to create innovative products made of plantation crop materials (palm, coconut, coffee, tea, sugar, pepper)</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: Definition, scope, purpose of studying plantation crop technology: Types of plantation crop commodities; The types of technology that can be applied in the processing of plantation crops</li> <li>2. Palm processing technology</li> <li>3. Coconut processing technology</li> <li>4. Coffee processing technology</li> <li>5. Tea processing technology</li> <li>6. Sugar processing technology</li> <li>7. Black and white pepper processing technology</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Essays exams</li> <li>3. Multiple choice exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Kementan. 2016. <i>Outlook Kopi, Komoditas Pertanian Subsektor Perkebunan</i>. Pusat Data dan Sistem Informasi Pertanian, Setjen Kementan. Jakarta</li> </ol>

2. Sage, E., 2015. *Coffee Brewing Wetting, Hydrolysis and Extraction Revisited*. Speciality Coffee Association of America
3. Yoshikazu, N., Goromaru-shinkai, M., Kuroda J., Kiuchi, S., dan Ihara, H. 2017. Estimation of protein, total polyphenol, chlorogenic acid, caffeine, and caffeic acid contents in Indonesian palm civet coffee (*Kopi Luwak*). *Int J Anal Bio-Sci* 5(4):53-56
4. Sipalavan, P., Kulasegaran, S., dan Khatiravetpillae. 2009. *Handbook on Tea*. Cornell University. USA.
5. *Praktek Penanganan Panen dan Pascapanen Tanaman Lada yang Baik*. 2016. Deutsche Gesellschaft fur Internationale Zusammenanbect (GIZ) Gmbh
6. Some related journal



Module designation	<i>Research Methods</i>
Semester (s) in which the module is taught	4 <sup>th</sup> semester/2 <sup>nd</sup> year
Person responsible for the module	1. Dr. Ir. Gatot Priyanto, M.S. 2. Prof. Dr. Ir. Daniel Saputra, M.S.A.Eng.
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	--
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the philosophy and general concepts of research methods course material</li> <li>2. understand on creativity and extraction of scientific resource information; scientific writing, ethic and plagiarism</li> <li>3. describe and apply the principle of scientific research proposal writing; scientific paper presentation; problem statement, hypothesis and frame of logical construct.</li> <li>4. understand and describe type of research, design and variable; data management, analysis and interpretation.</li> <li>5. understand and describe descriptive quantitative analysis research style; predictive and modelling research style.</li> <li>6. understand and describe research result discussion and conclusion; scientific report writing and author guideline</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction</li> <li>2. Creativity and Extraction of Scientific Resource Information</li> <li>3. Scientific Writing, Ethic and Plagiarism</li> <li>4. Scientific Paper Presentation</li> <li>5. Principle of Scientific Research Proposal Writing</li> <li>6. Problem Statement, Hypothesis and Frame of Logical Construct</li> <li>7. Presentation of Student Group Case Study-I</li> <li>8. Type of Research, Design and Variable</li> <li>9. Data Management, analysis and Interpretation</li> <li>10. Descriptive Quantitative Analysis Research Style</li> <li>11. Predictive and Modelling Research Style</li> <li>12. Research Result Discussion and Conclusion</li> <li>13. Scientific Report Writing and Author Guideline</li> <li>14. Presentation of Student Group Case Study-I</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Presentation</li> <li>2. Essay project</li> </ol>

## Reading List

1. Basten, G. 2014. Introduction to Scientific Research Project. Graham Baseten & Bookboon.com
2. 1.2. Rawlings, O., S. G. Pentula, and D. A. Dickey 1998. Applied Regression Analysis: A Research Tool. Springer-Verlag New York, Inc.
3. Wargiono, J. Hermanto, Sunihardi. 2009. Ubikayu: Inovasi Teknologi dan Kebijakan Pengembangan. Pusat Penelitian dan Pengembangan Tanaman Pangan, Badan Penelitian dan Pengembangan Pertanian. Bogor. Indonesia.
4. Feri Kusnandar, Rahayu, W.P. Marpaung, A.M. Santoso U. Perspektif Global Ilmu dan Teknologi Pangan jilid 2. IPB Press. Bogor. Indonesia.
5. Muchtadi, T.R. Sugiyono, Ayustaningwarno, F. 2014. Ilmu Pengetahuan Bahan Pangan. Alfabeta. Bandung. Indonesia.

Module designation	<i>Engineering Economics</i>
Semester (s) in which the module is taught	5 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	1. Dr. Ir. Umi Rosidah, M.S. 2. Dr. Eka Lidiasari, S.TP., M.Si.
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	---
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. think critically, identify the root of the problem and solve it comprehensively, and make the right decisions based on analysis of information and data</li> <li>2. describe and able to calculate time and money value relationship (present worth, future worth, annual worth, and gradient worth).</li> <li>3. calculate variable cost, and fix cost of agricultural equipment and machinery</li> <li>4. design feasibility study on financial analysis (NPV, IRR, BC ratio dan BEP)</li> <li>5. make appropriate decisions in the context of solving problems in business creation</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction</li> <li>2. The Concept of Time Value of Money</li> <li>3. Depreciation value</li> <li>4. Fix Cost Analysis of Agricultural Equipment and Machinery</li> <li>5. Variable Cost Analysis of Agricultural Equipment and Machinery</li> <li>6. Financial Analysis (Net Present Value)</li> <li>7. Financial Analysis (Internal Rate of Return)</li> <li>8. Financial Analysis (BC Ratio and Break Even Point)</li> <li>9. Market and Marketing Aspect Feasibility Study</li> <li>10. Feasibility Study of Technical and Technological Aspects</li> <li>11. Management Aspect Feasibility Study</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Calculating Assignments</li> <li>2. Essay exams</li> <li>3. Multiple choice exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Kodoatie, Robert J. 2005. Analisis Ekonomi Teknik. Penerbit Andi. Yogyakarta.</li> <li>2. Suad Husnan dan S. Muhammad. 2008. Studi Kelayakan Proyek. UPP STIM YKPN. Yogyakarta.</li> <li>3. Waldiono, Dr Ir MS. 2008. Ekonomi Teknik. Pustaka Pelajar. Yogyakarta.</li> </ol>

Module designation	<i>Nutritional Science</i>
Semester (s) in which the module is taught	5 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	1. Ir. NuraMalahayati, M.Sc., Ph.D. 2. Dr. Merynda Indriyani Syafutri, S.TP., M.Si.
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face-to-face lecture (offline) and E-Learning (online)
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for lecture; 170 minutes for practicum, 120 minutes for structured assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Food and Nutrition;</i> <i>Biochemistry II</i>
Module objectives/intended learning outcomes	After completing the course, students will be able to: <ol style="list-style-type: none"> <li>1. understand the source, structure, function, requirement, and role of nutrients in carbohydrates, proteins, fats, vitamins, minerals and water.</li> <li>2. understand metabolism of water and nutrients, digestion and absorption by body organs and their distribution into cells where further metabolic processes take place.</li> <li>3. identify problems with deficiency and excess of nutrients and metabolic errors.</li> <li>4. analyze biochemical processes, basic concepts of nutrition science and the relationship between food consumption and nutritional status, and health.</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: Historical Aspects (International and National)</li> <li>2. Water, Electrolyte, Acid and Base Energy. Energy Terms, Source, Digestibility, Calorimetry, Balance Method</li> <li>3. Carbohydrates : Source, Structure, Metabolism, Function, Requirement, Digestion Metabolism and Absorption, Clinical Importance (Effect of Excess and Deficiency)</li> <li>4. Lipid : Source, Structure, Metabolism, Function, Requirement, Digestion Metabolism and Absorption, Clinical Importance (Effect of Excess and Deficiency)</li> <li>5. Protein : Source, Structure, Metabolism, Function, Requirement, Digestion Metabolism and Absorption, Clinical Importance (Effect of Excess and Deficiency)</li> <li>6. Fat Soluble Vitamin : Source, Structure, Metabolism, Function, Requirement, Digestion Metabolism and Absorption, Clinical Importance (Effect of Excess and Deficiency)</li> <li>7. Water Soluble Vitamin : Source, Structure, Metabolism, Function, Requirement, Digestion Metabolism and Absorption, Clinical Importance (Effect of Excess and Deficiency)</li> <li>8. Macro Mineral : Source, Structure, Metabolism, Function, Requirement, Digestion Metabolism and Absorption, Clinical Importance (Effect of Excess and Deficiency)</li> </ol>

	<p>9. Micro Mineral : Source, Structure, Metabolism, Function, Requirement, Digestion Metabolism and Absorption, Clinical Importance (Effect of Excess and Deficiency)</p> <p>10. Role of Micronutrients (Vitamin and Mineral) in Energy Metabolism</p>
Examination forms	<ol style="list-style-type: none"> <li>1. Multiple choice exams</li> <li>2. Essay exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Anjana, A. and Sobha, A.U. 2014. Textbook of Human Nutrition. Jaypee Brothers Medical Pub; 1st edition (September 12, 2014)</li> <li>2. Krause, M.V. and Mahan L.K. 1984. Food, Nutrition and Diet Therapy. W.B. Saunders Company, Philadelphia.</li> <li>3. Global Nutrition Report 2020.</li> <li>4. Duncan, A.W. 2005. The Chemistry of Food and Nutrition. CRC Press. 1136 pages.</li> <li>5. Achmad, D.S. 2007. Ilmu Gizi. Dian Rakyat.</li> </ol>

Module designation	<i>Physiology and Postharvest Technology</i>
Semester (s) in which the module is taught	5 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. Ir. Anny Yanuriati, M.Appl.Sc.</li> <li>2. Dr. Merynda Indriyani Syafutri, S.TP., M.Si.</li> <li>3. Friska Syaiful, S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Biochemistry II</i>
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. explain the main postharvest physiology of perishable agricultural products</li> <li>2. explain how to control postharvest physiology of perishable agricultural products</li> <li>3. explain the relationship between postharvest physiology and the mechanism of damage and shelf life of perishable agricultural products</li> <li>4. explain the principles of techniques and analysis methods of postharvest physiology on perishable agricultural products</li> <li>5. describe the mechanism of postharvest perishable agricultural product damages and identify how to control them</li> <li>6. describe the principles and techniques on handling postharvest perishable agricultural products, as well as the influence of process parameters on quality, safety and shelf life of postharvest perishable agricultural products</li> <li>7. determine appropriate postharvest technology for extending the shelf life of perishable agricultural products</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Understanding postharvest physiology of perishable agricultural products and the scope of perishable agricultural products postharvest physiology; Evolution and development of perishable agricultural products postharvest technology</li> <li>2. Characteristics of postharvest perishable agricultural products; Post-harvest handling based on plant parts and structure</li> <li>3. Cell structure and function, tissue structure and postharvest yield composition; Relationship of tissue structure and postharvest damage.</li> <li>4. Metabolism of postharvest perishable agricultural products (respiration: substrate in the process of respiration; factors affecting the rate of respiration; respiration rate analysis); ethylene and transpiration; Ethylene biosynthesis dan its role on the ripening.</li> </ol>

	<ol style="list-style-type: none"> <li>5. Definition of transpiration, transpiration pathways and the factors that influence it.</li> <li>6. The process of maturation and senescence: respiration, ethylene biosynthesis dan its role on the ripening: chemical and biochemical changes</li> <li>7. Postharvest technology to slow the maturation and senescence processes of fruits and vegetables by chemical modification</li> <li>8. Postharvest technology to slow the maturation and senescence processes of fruits and vegetables by cold storage</li> <li>9. Postharvest technology to slow the maturation and senescence processes of fruits and vegetables by modification of the atmosphere and irradiation</li> <li>10. Postharvest technology (low temperature and modified atmosphere) and physiological changes of meat and poultry.</li> <li>11. Postharvest technology (low temperature and modified atmosphere) physiological changes in fish, shrimp and other types of fish commodities</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essays exams</li> <li>2. Multiple choice exams</li> <li>3. Practical works</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Kays, S. .Postharvest Physiology of Perishable Plant Products. 2012.</li> <li>2. Postharvest: An introduction to the physiology and handling of fruits, vegetables and ornamentals. 2016. RBH Wills and John Golding.</li> <li>3. Advances in postharvest fruit and vegetable technology. 2016. RBH Wills</li> <li>4. Some related postharvest journal</li> <li>5. Teknologi Pengolahan Daging. Peni Patriani et al. 2020. CV Anugerah Pangeran Jaya Press.</li> <li>6. Dasar-dasar Teknologi Hasil Perikanan. Rinto dan Wulandari. 2020.</li> <li>7. Dasar-dasar Process Pengolahan Bahan Pangan. Enceng Sobari. Polsus Press.</li> </ol>

Module designation	<i>Quality Assurance</i>
Semester (s) in which the module is taught	5 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	1. Prof. Dr. Ir. Basuni Hamzah, M.Sc. 2. Sugito, S.TP., M.Si.
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lectures, team-based and project-based learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	---
Module objectives/intended learning outcomes	<p>After completing this course, the students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the concept of quality and standards</li> <li>2. understand the concept of quality management and quality management system (ISO, halal, GMP)</li> <li>3. understand the importance of standards and regulations in quality management</li> <li>4. understand the principles of quality measurements (objective and subjective measurements on physical, chemical and microbiology characteristics of food and agricultural products).</li> <li>5. apply the statistical quality control (SQC) and to use standards in quality measurement.</li> <li>6. analyze current regulations related to food and agricultural product quality</li> <li>7. evaluate the current regulations in quality management system</li> <li>8. apply the concept of quality measurement, standards, and quality management system in a particular food or agricultural industry taking current regulations into consideration</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Fundamentals on quality and standards</li> <li>2. Standard and standardization</li> <li>3. Quality attributes and variables and measurement</li> <li>4. Statistical Quality Control</li> <li>5. Food Regulations</li> <li>6. Quality management system (ISO)</li> <li>7. Good Manufacturing Practises (GMP)</li> <li>8. Regulations on Halal</li> <li>9. Regulations on Food Additives</li> <li>10. Quality Standards on Food Additives</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Project Assignments</li> <li>2. Individual essay exam</li> <li>3. Presentation on projects</li> </ol>



Reading List	<ol style="list-style-type: none"><li>1. Food Quality Assurance Principle and Practices By Inteaz Alli Roudledge Publisher, 2003 1st Edition</li><li>2. Food Quality Management Technological an managerial Principles and Practices. By Pieterneel A. Luning and Willem J, Marcelis Wageningen Academic Publisher 1stEdition</li><li>3. Good Manufacturing Practices for Food Processing Industries: Purposes, Principles, and Practical Application By Murlidhar Meghwal CRC Publisher, 2016 1st Edition</li><li>4. Hazard Analysis and Critical Control Point: Principles and Application By Merle D. Pierson Springer Science Publisher, 2012 1 Edition</li></ol>
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Module designation	<i>Preservation Technology</i>
Semester (s) in which the module is taught	5 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. Ir. Gatot Priyanto, M.S.</li> <li>2. Dr. Ir. Budi Santoso, M.Si.</li> <li>3. Dr. Ir. Tri Wardani Widowati, M.P.</li> <li>4. Dr. Ir. Parwiyanti, M.P.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Material Science</i>
Module objectives/intended learning outcomes	<p>After completing this course, the students will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the description, purpose and function of preservation technology, the development of preservation technology, the role of preservation technology in the Industrial System and Enhanced Value Added; basic concepts of food preservation and determine the factors causing spoilage and prevention</li> <li>2. Understand and explain Moisture control as the basis of preservation; Damage index and utilization; Room temperature storage management for preservation; preservation mechanism with water activity control (water activity, aw) and can explain the use of humectants in preservation technology under various storage conditions</li> <li>3. Understand and explain the mechanism of preservation of commodities by packaging; Aspects of preservation in traditional and conventional packaging; innovative packaging design</li> <li>4. Understand and explain the types and mechanisms of preservation with chemicals; Application of fumigation in conventional preservation; Regulation of the use of chemical preservatives</li> <li>5. Understand and explain the mechanism of preservation with low temperature; Freezing of food/agricultural products and their processing; Low temperature/freeze preservation management</li> <li>6. Understand and explain the mechanism of the preservation system with heat treatment and conventional and non-conventional heating methods; Radiation application basis for preservation; Irradiation based preservation mechanism; Application of irradiation in commodity preservation</li> <li>7. Understand and explain the application of biotechnology and fermentation in conventional and non-conventional preservation technologies</li> <li>8. Understand and explain multiple preservation systems, synergistic effects and hurdle theory.</li> </ol>

	<p>9. Understand and explain the risks of processed materials and their preservation factors; Types and basic methods of preservation of processed materials Application of conventional preservation techniques of processed materials; Modernization of local food into innovative products; Preservation system optimization</p>
Content	<ol style="list-style-type: none"> <li>1. Introduction: Description of preservation technology, development of preservation technology, Preservation Technology in Industrial Systems and Increased Value Added</li> <li>2. basic philosophy and basic concepts of preservation</li> <li>3. Ambient temperature of fresh &amp; postharvest commodities; Preservation with controlled atmosphere and room temperature</li> <li>4. Low temperature and freeze preservation</li> <li>5. Packaging System for preservation</li> <li>6. Drying and Control of Water Activities; Preservation System with Humectant based</li> <li>7. Chemical Preservative Additives (BTP-Kimia)</li> <li>8. Energy and Heat Applications in Preservation</li> <li>9. Preservation by Irradiation</li> <li>10. Biotechnology and fermentation-based preservation</li> <li>11. Conventional food preservation and modifying local food products into innovative products</li> <li>12. Non-conventional Preservation of food products</li> <li>13. Optimization of preservation system</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Project</li> <li>2. Multiple choice exams</li> <li>3. Practical works</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Rahman, M. S. 2007. Handbook of food preservation. 2007. Taylor &amp; Francis Group, CRC Press LLC. Boca Raton FL 33431, USA.</li> <li>2. Zeuthen, P., and L. Bøgh-Sørensen. 2003. Food Preservation Techniques. CRC Press LLC. Boca Raton FL 33431, USA.</li> <li>3. Hariyadi, P. 2019. Masa Simpan dan Batas Kadaluwarsa Produk Pangan. Gramedia. Jakarta.</li> <li>4. Russell N.J. dan Gould G.W. 2003. Food Preservatives. Kluwer Academic/Plenum Publishers, New York.</li> <li>5. Gatot Priyanto. 1987. Teknik Pengawetan Pangan. Pusat Antar Universitas Pangan dan Gizi Universitas Gadjah Mada, Yogyakarta.</li> <li>6. Labuza, T.P. 1982. Shelf-Life Dating of Foods. Food and Nutrition Press, Inc., Westport, Connecticut. USA</li> </ol>

Module designation	<i>Packaging and Storage</i>
Semester (s) in which the module is taught	5 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. Ir. Gatot Priyanto, M.S.</li> <li>2. Dr. Ir. Budi Santoso, M.Si.</li> <li>3. Dr. Ir. Anny Yanuriati, M.Appl.Sc.</li> <li>4. Dr. Eka Lidiasari, S.TP., M.Si.</li> <li>5. Friska Syaiful, S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Principles of Agricultural Products Processing</i>
Module objectives/intended learning outcomes	<p>After completing this course, the students will be able to:</p> <ol style="list-style-type: none"> <li>1. describe basic understanding of overview and philosophy (purpose, function, brief description, and development/future) of packaging and storage course</li> <li>2. describe the characteristics and uses of packaging materials and its application</li> <li>3. describe and explain the conventional and non-conventional packaging; the utilization of organic/traditional packaging (leaves, wood and paper); the utilization of inorganic packaging (bottles, metal &amp; composite) and (synthetic, plastic, multilayer etc.)</li> <li>4. describe and explain the utilization of coating (edible &amp; non-edible coating) and film for packaging</li> <li>5. describe and explain the modified and control atmosphere storage; the Storage development of Fermentation and Biotechnology Products</li> <li>6. understand and describe the ambient temperature based storage, the Low Temperature and Freezing Storage, the development of these types of storage</li> <li>7. understand and describe the basic aspect of labeling, label design, innovative labeling</li> <li>8. understand and describe warehouse design, warehouse system development, storage system management</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: overview and philosophy (purpose, function, brief description, and development/future)</li> <li>2. Characteristics and basic use of packaging</li> <li>3. Overview conventional &amp; non-conventional packaging</li> <li>4. Traditional/organic packaging (leaves, wood and paper.)</li> <li>5. Coating: edible &amp; non-edible coating</li> <li>6. Inorganic packaging (bottles, metal &amp; composite) and (synthetic, plastic, multilayer etc.)</li> </ol>

	<ol style="list-style-type: none"> <li>7. Modified &amp; Control Atmosphere Storage (M/C US)</li> <li>8. Storage of Fermentation Products and Biotechnology</li> <li>9. Low Temperature and Freezing Storage (freezing &amp; cold storage)</li> <li>10. Storage at Ambient Temperature based on Packaging</li> <li>11. Labeling: labeling principles and norms</li> <li>12. Graphic design and label creation</li> <li>13. Warehouse Design and Storage System Management</li> <li>14. Capita Selecta: Packaging &amp; Process Product Development in Warehousing/Storage</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Multiple choice exams</li> <li>3. Practical works</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Kadoya, T. 1990. Food Packaging. Academic Press, INC. San Diegp, New York.</li> <li>2. Ahvenainen, R. 2000. Novel Food Packaging Techniques. CRC Press, Boca Raton Boston New York, Washington DC.</li> <li>3. Croctha, JM., Baldwin, EA., and Nisperos-Carriedo, MO. 1994. Edible Coatings and Edible Film to Improve Food Quality. Technomic Publishing Company INC, Pennsylvania USA.</li> <li>4. Santoso, B. 2022. EDIBLE FILM: teknologi dan aplikasinya. CV Amerta Media, Jawa Tengah.</li> </ol>

Module designation	<i>Waste Handling Technology</i>
Semester (s) in which the module is taught	5 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. Ir. Gatot Priyanto, M.S.</li> <li>2. Dr. Ir. Budi Santoso, M.Si.</li> <li>3. Dr. rer. nat. Ir. Agus Wijaya, M.Si.</li> <li>4. Dr. Ir. Tri Wardani Widowati, M.P.</li> <li>5. Dr. Ir. Parwiyanti, M.P.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining themodule	----
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. describe water requirements for processing agricultural products and how to manage waste from processing products agriculture</li> <li>2. apply and incorporate the principles of agricultural products science in practice and real conditions in the produce industry agriculture</li> <li>3. understand the latest issues in the field of agricultural products</li> <li>4. analyze problems with agricultural products technology approach in solving production problems and agricultural products so that they are efficient, safe, and with guaranteed quality</li> <li>5. apply logical, critical, systematic, and innovative thinking in the context of the development or implementation of science and technology that pay attention to and applies humanities values in accordance with their field of expertise</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: Definition of waste, the relationship between waste and environmental pollution.</li> <li>2. Types and characteristics of waste: liquid, solid, gas</li> <li>3. Regulations and laws relating to waste quality standards</li> <li>4. Concept of Sustainable Agroindustrial Waste Management</li> <li>5. Technical aspects and design and construction of waste gas handling</li> <li>6. Technical aspects and design of liquid waste handling</li> <li>7. Technical aspects and design of solid waste handling,</li> <li>8. Discussion: presentation and discussion on utilization, management, waste treatment</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Multiple choice exams</li> </ol>

Reading List	<ol style="list-style-type: none"><li>1. Jern, N.G.W. 2006. Industrial Wastewater Treatment. Imperial College Press, London, UK.</li><li>2. Jenie, B.S.L dan W.P. Rahayu. 1993. Penanganan Limbah Industri Pangan. Penerbit Kanisius. Jakarta</li><li>3. Polprasert, P. 2007. Organic Waste Recycling Technology and Management. IWA Publishing. London.</li></ol>
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Module designation	<i>Thermobacteriology*</i>
Semester (s) in which the module is taught	5 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	1. Prof. Dr. Ir. Basuni Hamzah, M.Sc. 2. Dr. Ir. Tri Wardani Widowati, M.P.
Language	Indonesian
Relation to curriculum	Elective Courses
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	General Microbiology
Module objectives/intended learning outcomes	After completing the course, students will be able to: <ol style="list-style-type: none"> <li>1. explain environmental factors that affect thermophilic bacterial growth</li> <li>2. Identify conditions for inactivating and killing thermophilic bacterial and it's endospore</li> <li>3. explain of an application heat process on food stuffs</li> <li>4. describe principles of heat and mass transfer process of agricultural product processing</li> <li>5. calculate of thermal process adequacy (D value, F value and Z value)</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction : History of the development of thermal processes and microbiological aspects that affect thermal processes</li> <li>2. Thermophilic Microbes (Heat resistant bacteria)</li> <li>3. Bacterial spores (endospores)</li> <li>4. Thermal Process Applications for foodstuffs (blanching and pasteurization)</li> <li>5. Thermal Process Applications for foodstuffs (Sterilization))</li> <li>6. Thermal Process Applications for foodstuffs (canning and aseptic processing)</li> <li>7. Introduction to thermal process evaluation</li> <li>8. The concept of Thermal Death Time: The rate of microbial growth and microbial destruction</li> <li>9. D value calculation</li> <li>10. Z value calculation</li> <li>11. F value calculation</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Calculating Assignments</li> <li>2. Multiple choice exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Principle of Food Processing. Publisher : Springer. 1999. Chapter : Comercial Sterilization (<u>Dennis R. Heldman</u> &amp; <u>Richard W. Hartel</u>)</li> </ol>



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|  | <ol style="list-style-type: none"><li>2. Principles of Thermal Processing of Packaged Foods. Publishing: Virginia Tech. 2020.(Ricardo Simpson, Helena Nunez, Cristian Ramirez)</li><li>3. Essential Thermal Processing. Publisher: Wiley. 2010 (<u>Gary Tucker, Susan Featherstone</u>)</li><li>4. Madigan, M.T., Martinko, J.M. and Parker, J. 2003. Brock Biology of Microorganisms. 10th ed. Prentice Hall. New Jersey.</li></ol> |
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Module designation	<i>Functional Food and Food Phytochemistry*</i>
Semester (s) in which the module is taught	5 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	1. Dr. rer. nat. Ir. Agus Wijaya, M.Si. 2. Sugito, S.TP., M.Si.
Language	Indonesian
Relation to curriculum	Elective Courses
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Biochemistry II</i>
Module objectives/intended learning outcomes	After completing the course, students will be able to: 1. understand definition and health benefit of food phytochemistry 2. understand definition and health benefit of functional food 3. explain some examples of food phytochemistry, including mode of action and application 4. explain some examples of functional food, including mode of action and application. 5. explain the stability, safety and efficacy as well as regulation for functional food.
Content	1. Introduction to functional food food phytochemistry 2. Sources, function, classification of food phytochemistry and health benefit 3. Food phenolic substances: source and health benefit 4. Flavor system for functional food 5. Probiotics: definition, mode of action and application 6. Prebiotics and dietary fiber: definition, mode of action and application 7. Fatty acids and oil 8. Vegetable, fruit, spices as bioactive compound sources 9. Vitamin and mineral fortification on nutraceuticals and functional foods 10. Antioxidants and its health roles 11. The safety and efficacy of functional foods and ingredients 12. The stability of functional food products 13. Regulations regarding functional foods and their health claims (USA, European Union and Indonesia)
Examination forms	1. Essay exams 2. Multiple choice exams 3. Practical works

Reading List

1. Cho, S.S. and Finocchiaro, E.T. 2010. Handbook of Prebiotics and Probiotics Ingredients. CRC Press. Boca Raton.
2. Farnworth, E.R. (Ed.). 2003. Handbook of fermented functional foods. CRC Press, Boca Raton, USA.
3. Kneifel, W. and Salminen, S. 2011. Probiotics and Health Claims. Wiley-Blackwell.
4. Roberfroid, M. 2005. Inulin-Type Fructans. CRC Press. Boca Raton.
5. Schmidl, M.K. and Labuza, T.P. (Eds.). 2000. Essentials of functional foods. Aspen publication, Maryland, USA.

Module designation	<i>South Sumatera Traditional Food Processing Technology*</i>
Semester (s) in which the module is taught	5 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	1. Prof. Ir. Filli Pratama, M.Sc., (Hons)., Ph.D. 2. Dr. Ir. Pawiyanti, M.P.
Language	Indonesian
Relation to curriculum	Elective Courses
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	-----
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand <i>South Sumatera Traditional Food Processing Technology</i> course material and the diversity of traditional foods of South Sumatera.</li> <li>2. understand and explain the processing of pempek and its development of pempek into an innovative product</li> <li>3. understand and explain the “Pindang” technology and its development</li> <li>4. understand and explain the processing technology and development of the maksuba cake, the bolu kojo cake, the 8 Jam cake, and their development</li> <li>5. understand and explain the technology involved in processing sambalengkung and its development.</li> <li>6. understand and explain the process technology of laksa and its development</li> <li>7. understand and explain the process technology of bekasam (fermented fish) and its development</li> <li>8. understand and explain the process technology of tempoyak (fermented durian) and its development</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction (definition, objectives, scope area, course contract)</li> <li>2. Diversity of South Sumatra Traditional Food</li> <li>3. Pempek technology and development</li> <li>4. Discussion forum and presentation of the technological development of pempek as well as video display of the product</li> <li>5. Pindang technology and development</li> <li>6. Maksuba cake technology and development</li> <li>7. Bolu Kojo cake technology and development</li> <li>8. 8 Jam cake technology and development</li> <li>9. Sambalengkung processing technology</li> <li>10. Laksa technology and development</li> <li>11. Bekasam technology and development</li> <li>12. Tempoyak (fermented durian) technology and development</li> </ol>

Examination forms	<ol style="list-style-type: none"><li>1. Essay Assignments</li><li>2. Essay exams</li><li>3. Multiple choice exams</li><li>4. Practical works</li></ol>
Reading List	<ol style="list-style-type: none"><li>1. Tsai, M., Liew, C., Ling, K.F. 2002. The Food of Asia: Fabulous Recipes from Every Corner of Asia. Periplus Edition (HK). 193 pages</li><li>2. Pitch, P. 2002. Healing with Whole Foods: Asian Traditions and Modern Nutrition. North Atlantic Books, Berkeley, California. 780 pages.</li></ol>

Module designation	<i>Halal Assurance System*</i>
Semester (s) in which the module is taught	5 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Sugito, S.TP., M.Si.</li> <li>2. Ir. Nura Malahayati, M.Sc., Ph.D.</li> <li>3. Dr. Ir. Tri Wardani Widowati, M.P.</li> </ol>
Language	Indonesian
Relation to curriculum	Elective Courses
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the Introduction consist of definition, definition, basic concepts, understanding of halal and haram law, scope of halal</li> <li>2. understand and explain the policies of halal certification and procedures for applying for halal certification</li> <li>3. understand and explain the knowledge of animal materials, vegetable ingredients, Microbial products and other materials</li> <li>4. understand and explain the Halal Assurance System Manual</li> <li>5. understand and explain auditor, audit process and its implementation</li> <li>6. understand and explain the Slaughtering house audit for Ruminants and poultry, the Restaurant and Food Processing Industry Audit</li> <li>7. understand and explain the audit evaluating and reporting</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: definition, understanding and the fundamental halal law and scope of halal</li> <li>2. Halal certification policies and procedures</li> <li>3. Knowledge of Animal Materials</li> <li>4. Knowledge of Vegetable ingredients</li> <li>5. Knowledge of Microbial products</li> <li>6. Knowledge of other materials</li> <li>7. Halal Assurance System Manual (1- 5)</li> <li>8. Halal Assurance System Manual (6-11)</li> <li>9. Audit Technique</li> <li>10. Audit and Auditor</li> <li>11. Audit Method &amp; Implementation</li> <li>12. Slaughtering house audit for Ruminants and poultry</li> <li>13. Restaurant and Food Processing Industry Audit</li> <li>14. Audit evaluation and reporting</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Essay exams</li> <li>3. Multiple choice exams</li> </ol>

## Reading List

1. LPPOM MUI. 2017. Persyaratan Bahan Pangan Halal (HAS 23201). Lembaga Pengkajian Pangan Obat dan Kosmetik MUI. 75 pages.
2. LPPOM MUI. 2020. Pengetahuan Titik Kritis Kehalalan Bahan Obat (HAS 23202). Lembaga Pengkajian Pangan Obat dan Kosmetik MUI. 90 pages.
3. LPPOM MUI. 2012. Pedoman Pemenuhan Kriteria Sistem Jaminan Halal di Rumah Potong Hewan (HAS 23103). Lembaga Pengkajian Pangan Obat dan Kosmetik MUI. 100 pages.
4. LPPOM MUI. 2021. Persyaratan Sertifikasi Halal Industri Logistik (HAS 23000-5). Lembaga Pengkajian Pangan Obat dan Kosmetik MUI. 32 pages.
5. LPPOM MUI. 2021. Persyaratan Sertifikasi Halal Industri Farmasi (HAS 23000-4). Lembaga Pengkajian Pangan Obat dan Kosmetik MUI. 47 pages.
6. LPPOM MUI. 2021. Persyaratan Sertifikasi Halal Restoran dan Jasa Boga (HAS 23000-3). Lembaga Pengkajian Pangan Obat dan Kosmetik MUI. 75 pages.
7. LPPOM MUI. 2021. Persyaratan Sertifikasi Halal Industri Produk Olahan Daging (HAS 23000-2). Lembaga Pengkajian Pangan Obat dan Kosmetik MUI. 48 pages.
8. LPPOM MUI. 2021. Persyaratan Sertifikasi Halal Industri Pengolahan Umum (HAS 23000-1). Lembaga Pengkajian Pangan Obat dan Kosmetik MUI. 51 pages.

Module designation	<i>Postharvest Tool and Machine*</i>
Semester (s) in which the module is taught	5 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	1. Prof. Dr. Ir. Amin Rejo, M.P. 2. Ir. Haisen Hower, M.P.
Language	Indonesian
Relation to curriculum	Elective Courses
Teaching methods	Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Introduction to Agricultural Technology</i>
Module objectives/intended learning outcomes	After completing the course, students will be able to: <ol style="list-style-type: none"> <li>1. describe the principle of unit operation and unit process in the agricultural product industry</li> <li>2. identify the appropriate operating unit and process equipment in the processing of agricultural products</li> <li>3. understand the latest issues in the field of agricultural products</li> <li>4. apply logical, critical, systematic, and innovative thinking in the context of the development or implementation of science and technology that pay attention to and applies humanities values in accordance with their field of expertise</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction to heat_physical properties</li> <li>2. Air properties</li> <li>3. Mass-volume-area</li> <li>4. Psychrometric</li> <li>5. Drying</li> <li>6. Basic drying,</li> <li>7. Mechanism and type of dryer</li> <li>8. Extrusion</li> <li>9. mechanisms extrusion</li> <li>10. Types and tools extraction</li> <li>11. Separation physical</li> <li>12. Chemical, thermal and tool separation</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Multiple choice exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. P.J.FRYER, D.L. PYLE, and C.D. RIELLY. 1997. Chemical Engineering for the Food Industry. Springer Science, Business Media Dordrecht, Hongkong.</li> <li>2. M. A. Rao, Syed S. H. Rizvi, and Ashim K. Datta. 2005. Engineering Properties of Foods. CRC Press Taylor &amp; Francis Group</li> </ol>



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|  | <p>3. Zeki Berk. 2009. Food Process Engineering and Technology.<br/>Department of Biotechnology and Food Engineering TECHNION<br/>Israel Institute of Technology, Israel</p> |
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Module designation	<i>Fermentation Technology</i>
Semester (s) in which the module is taught	6 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	1. Dr. rer.nat. Ir. Agus Wijaya, M.Si. 2. Prof. Dr. Ir. Basuni Hamzah, M.Sc. 3. Dr. Ir. Tri Wardani Widowati, M.P.
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>General Microbiology</i>
Module objectives/intended learning outcomes	After completing the course, students will be able to: 1. describe definition of fermentation, history and its application 2. describe selection, characterization and strain development of microbes for fermentation 3. describe media and their constraint for fermentation 4. describe inoculum storage and inoculum development for fermentation 5. describe sterilization process for media and equipment for fermentation 6. explain microbial growth in the types of fermentor design 7. describe design and fermentor instrument 8. explain process control of fermentor (agitation, aeration) and scale up 9. explain downstream process and purification of fermentation products 10. describe economy of fermentation
Content	1. Introduction (including definition of fermentation, history and its application) 2. Microbes for fermentation 3. Media for fermentation 4. Strain development 5. Biofilm 6. Storage and inoculum preparation 7. Microbial growth 8. Sterilization 9. Design and fermentor instrument 10. Process control: agitation and aeration 11. Scale up 12. Downstream process 13. Purification of fermentation products 14. Economy of fermentation
Examination forms	1. Essay exams

	<ol style="list-style-type: none"><li>Multiple choice exams</li><li>Practical works</li></ol>
Reading List	<ol style="list-style-type: none"><li>Stanburry, P.F., Whitaker, A. and Hall, S.J. 2012. Principles of Fermentation Technology. 2nd edition. Elsevier.</li></ol>

Module designation	<i>Technopreneurship</i>
Semester (s) in which the module is taught	6 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. Ir. Gatot Priyanto, M.S.</li> <li>2. Dr. Ir. Umi Rosidah, M.S.</li> <li>3. Dr. Ir. Parwiyanti, M.P.</li> <li>4. Dr. Budi Santoso, S.TP., M.Si.</li> <li>5. Dr. Eka Lidiasari, S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Engineering Economics</i>
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. internalize the spirit of independence, struggle, and entrepreneurship</li> <li>2. think critically, identify the root of the problem and solve it comprehensively, and make the right decisions based on analysis of information and data</li> <li>3. have professional integrity and is committed to ethical values</li> <li>4. have an attitude to life-long learning</li> <li>5. lead and work in a team, independent and responsible for his work.</li> <li>6. cooperate with individuals who have diverse social and cultural backgrounds</li> <li>7. adapt to the situation at hand and handle various activities simultaneously in various condition</li> <li>8. provide added value to agricultural products with Indonesian characteristics, especially the Southern part of Sumatera with locally-based agricultural products and optimal utilization of Indonesia's biological diversity through production processes that are safe, standardized, efficient, and effective</li> <li>9. demonstrate independent, quality, and measureable performance</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: Mindset Business (understanding of business and traders, growth mindset, fixed mindset, entrepreneur, mentor, coaching, business opportunities in the digital era)</li> <li>2. Starting a Business: model business canvas (BMC)</li> <li>3. Business Vision and Mission</li> <li>4. Leadership and BOM (Business Owner Mentality)</li> <li>5. Marketing (reseller and digital marketing)</li> <li>6. Branding and Packaging</li> <li>7. Team Building: managing HR. Building loyalty</li> <li>8. Legality and Cashflow</li> <li>9. Guest Lecturer (Professional)</li> <li>10. Business incubators and the role of business coaching</li> <li>11. PMW Program, PKMI, Indonesian Innovation Startup</li> </ol>

	12. Business proposal: proposal discussion and discussion
Examination forms	<ol style="list-style-type: none"><li>1. Oral Presentation</li><li>2. Practical works</li></ol>
Reading List	<ol style="list-style-type: none"><li>1. Coach Fahmi. 2017. Strategi anak muda bikin bisnis UMKM go Internasional, Intimedia, Malang, Indonesia.</li><li>2. Coach Fahmi. 2016. Sukses membangun bisnis dengan Grounded Strategi. Inteligencia Media, Malang, Indonesia.</li><li>3. Coach Fahmi. 2020. Strategi Jitu Business Recovery. Inteligencia Media, Malang, Indonesia.</li></ol>

Module designation	<i>Product Development</i>
Semester (s) in which the module is taught	6 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. Ir. Gatot Priyanto, M.S.</li> <li>2. Dr. Budi Santoso, S.TP., M.Si.</li> <li>3. Hermanto, S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Material Science</i> <i>Principles of Agricultural Products Processing</i>
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. apply and incorporate the principles of agricultural products science in practice and real conditions in the produce industry agriculture</li> <li>2. develop agricultural products based on the principles of agricultural science</li> <li>3. design the development of agricultural products that meet the quality criteria of agricultural products, are safe, nutritious and/or useful based on the principles of agricultural technology</li> <li>4. analyze problems with agricultural products technology approach in solving production problems and agricultural products so that they are efficient, safe, and with guaranteed quality</li> <li>5. provide added value to agricultural products with Indonesian characteristics, especially the Southern part of Sumatera with locally-based agricultural products and optimal utilization of Indonesia's biological diversity through production processes that are safe, standardized, efficient, and effective</li> <li>6. examine the implications of developing or implementing science and technology that pay attention to and applies humanities values according to their expertise based on scientific principles, procedures and ethics in order to produce solutions, ideas, designs or art criticism</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction</li> <li>2. The Importance of Product Development</li> <li>3. General aspect comparative of New and Old Product</li> <li>4. Consumer Needs Criteria of New Product</li> <li>5. Fundamental Stage for Developing Product</li> <li>6. SWOT and Strategic Analysis on Product Development</li> <li>7. Product Presentation of Student Group Case Study-I</li> <li>8. Law Protection of Innovation and New Product</li> <li>9. New Product Marketing and Promotion</li> <li>10. Special Topic: Marginal and Traditional Food Development</li> <li>11. Special Topic: Nonfood Product Development</li> </ol>

	<ol style="list-style-type: none"><li>12. Computer Aided Technique in Agricultural Product Development</li><li>13. Special topic: Computer Program on New Packaging Design</li><li>14. Presentation of Student Group Case Study-II</li></ol>
Examination forms	<ol style="list-style-type: none"><li>1. Oral Presentation</li><li>2. Practical works</li></ol>
Reading List	<ol style="list-style-type: none"><li>1. Earle, M., R. Earle, and A. Anderson. 2001. Food Product Development. CRC Press LLC. Boca Raton FL 33431.</li><li>2. Aramouni, F., and K. Deschenes. 2007. Methods for Developing New Food Product: An Instructional Guide. DEStech Publications, Inc., PA 1 2067, USA</li></ol>

Module designation	<i>Agricultural Industry Management</i>
Semester (s) in which the module is taught	6 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	1. Dr. Ir. Umi Rosidah, M.S. 2. Dr. Ir. Kiki Yuliati, M.Sc.
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Lectures and team-based learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	-----
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the five functions of management in the agro-industrial business.</li> <li>2. analyze factors affecting decision making on the market, raw materials, technology acquisition, and the location of the agro-industry.</li> <li>3. apply management functions to plan the market, raw material purchasing, technology acquisition, and the location of the agro-industry.</li> <li>4. evaluate the current problem faced by agro-industries in Indonesia using data and information on the market, raw material availability, technology used, and location of the agro-industry.</li> <li>5. formulate alternative solutions/recommendations based on related data and information to solve agro-industrial problems.</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Five functions of management applied in agro-industry</li> <li>2. Market strategy</li> <li>3. Technology management</li> <li>4. Supply chain management</li> <li>5. Determination of factory location</li> <li>6. Production capacity</li> <li>7. Product design and development</li> <li>8. Factory layout</li> <li>9. Transportation model</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Project Assignments</li> <li>2. Individual essay exam</li> <li>3. Oral Presentation of projects</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Hillier, Frederick S dan Lieberman, Grald, J. 1994. Pengantar Riset Operasi (terjemahan). Erlangga. Jakarta</li> <li>2. Lakovov, Eleftherios, Donysis Bochty, Dimitrios Vlachos, Dimitrios Aidom. 2016. Supply chain management for sustainable food networks. John Wiley &amp; Sons Ltd. United Kingdom</li> <li>3. Taha, A.Hamdy. . Riset Operasi (terjemahan) Jilid 1 dan 2. Bina Rupa Aksara. Jakarta.</li> </ol>



Module designation	<i>Agricultural Product Process Engineering</i>
Semester (s) in which the module is taught	6 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. Ir. Gatot Priyanto, M.S.</li> <li>2. Dr. Eka Lidiasari, S.TP., M.Si.</li> <li>3. Hermanto, S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<ol style="list-style-type: none"> <li>1. Calculus</li> <li>2. Operation Unit II</li> </ol>
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand and explain the principles of agricultural product process engineering</li> <li>2. understand and explain the general aspect of transport phenomena, kinetic analysis and fundamental concept of modeling process</li> <li>3. understand and explain the application model on agricultural Product Processing and Fundamental concept of Scale-up</li> <li>4. understand and explain the prediction model of processing time and product quality changes</li> <li>5. understand and explain the extraction process, active substance degradation, fortification and supplementation technique</li> <li>6. understand and explain the fundamental aspect of process Optimization and simulation</li> <li>7. understand the application of computer technique in process engineering</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction</li> <li>2. General aspect of transport phenomena</li> <li>3. General aspect of kinetic analysis</li> <li>4. Fundamental concept of modeling process</li> <li>5. Application model on Agricultural Product Processing</li> <li>6. Fundamental concept of Scale-up</li> <li>7. Presentation of Student Group Case Study-I</li> <li>8. Prediction model of Processing Time</li> <li>9. Prediction model of Product Quality Changes</li> <li>10. Extraction process and Active Substance Degradation</li> <li>11. Fortification and supplementation technique</li> <li>12. Fundamental aspect of Process Optimization and Simulation</li> <li>13. Element Computer Aided Technique in Process Engineering</li> <li>14. Presentation of Student Group Case Study-II</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Project Assignments</li> <li>2. Individual essay exams</li> </ol>

	3. Oral Presentation of projects
Reading List	<ol style="list-style-type: none"><li>1. Heldman, D.R. dan D.B.Lund. 2007. Handbook of Food Engineering. 2nd.Ed. CRC Press-Taylor &amp; Francis Group. Boca Raton, London, New York.</li><li>2. Wirakartakusumah, M.A., B. Nurtama, G.Priyanto dan M. Aprpah. 1992. Teknik Pangan Lanjut. Monograph. PAU Pangan dan Gizi IPB., Bogor.</li><li>3. Jun, S. and J.M.Irudayaraj. 2009. Food Processing Operation Modeling (Design and Analysis). 2<sup>nd</sup>Ed. CRC Press Taylor and Francis Group. Boca Raton, London, New York.</li></ol>

Module designation	<i>System Analysis</i>
Semester (s) in which the module is taught	6 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	1. Dr. Ir. Edward Saleh, M.P. 2. Dr. Ir. Kiki Yuliati, M.Sc.
Language	Indonesian
Relation to curriculum	Elective course
Teaching methods	Lectures and project-based learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	----
Module objectives/intended learning outcomes	After completing the course, students will be able to: <ol style="list-style-type: none"> <li>1. understand the concept of system in agriculture</li> <li>2. identify the elements of a particular agricultural system, their relationships, in a certain system boundary.</li> <li>3. analyze the cause-and-effect relationships among the elements of a particular agricultural system</li> <li>4. construct the input-output diagram based on cause-and-effect analysis</li> <li>5. apply system analysis techniques to construct simple model for a particular agricultural system</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction to system analysis: system thinking, system approach, system concept and system characteristics</li> <li>2. The concept of system boundary, system elements and system objectives.</li> <li>3. System elements and their relationships</li> <li>4. Cause-and-Effect analysis and diagram</li> <li>5. Input-Output diagram</li> <li>6. Feedback mechanism in a system</li> <li>7. Flow chart</li> <li>8. Decision making with system modeling</li> <li>9. Application of a systems approach to agricultural systems</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Project Assignments</li> <li>2. Individual essay exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Charles S. Wasson, 2016. System Engineering Analysis, Design, And Development - Concepts, Principles, and Practices. John Wiley &amp; Sons, Inc., Hoboken, New Jersey.</li> <li>2. Eriyatno. 1999. Ilmu Sistem : Meningkatkan Mutu dan Efektivitas Manajemen. Bogor: IPB Press.</li> </ol>

Module designation	<i>Tropical Horticulture Processing Technology</i>
Semester (s) in which the module is taught	6 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. Ir. Anny Yanuriati, M.Appl.Sc.</li> <li>2. Friska Syaiful, S.TP., M.Si.</li> <li>3. Sugito, S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Elective course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	----
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the main chemical, physical and biochemical characteristics of postharvest horticultural products</li> <li>2. understand the handling, maintaining, controlling of horticultural products quality before processing,</li> <li>3. understand current technology development and challenges in processing of horticultural products</li> <li>4. identify the main and current processing technologies used to process horticultural products</li> <li>5. apply their understanding on current processing technologies development and challenges to create innovative products made of horticultural products</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: horticulture and nutrition</li> <li>2. Minimally processed of fruits and vegetables</li> <li>3. Non thermal processing : high pressure process, pulse electric field, Irradiation, Pulse light, ultrasound)</li> <li>4. Hurdle technology</li> <li>5. Juice processing</li> <li>6. Jam, jelly and marmalade processing</li> <li>7. Frozen horticultural product processing</li> <li>8. Dehydrated products</li> <li>9. Canned horticultural products</li> <li>10. Safety of processing of fruits and vegetables</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Essay exams</li> <li>3. Multiple choice exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Handbook of fruits and fruit processing. 2012. Sinha, N.K. and J.S. Sidhu. John Wiley and Sons Ltd.</li> <li>2. Processing Fruits. 2005. Barret, D.M., Somogyi, L. and Ramaswamy, H. CRC Press LLC.</li> </ol>

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|  | <ol style="list-style-type: none"><li>3. Handbook of vegetable preservation and Processing. 2004. Hui, Y.H. <i>et al.</i> Marcel Dekker Inc.</li><li>4. Handbook of food preservation. 2007. M. Shafiur Rahman CRC Press.</li><li>5. Some Related Journals</li></ol> |
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Module designation	<i>Nutrition Evaluation in Processing</i>
Semester (s) in which the module is taught	6 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	1. Ir. Nura Malahayati, M.Sc., Ph.D. 2. Dr. Merynda Indriyani Syafutri, S.TP., M.Si.
Language	Indonesian
Relation to curriculum	Elective course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for contact study; 160 minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	---
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the principle of food processing</li> <li>2. understand the characteristics of nutrients</li> <li>3. identify the factors that affect the nutritional value of food during processing</li> <li>4. analyze the effect of processing (high temperature, low temperature, drying, irradiation, fermentation, and use of chemicals on the presence of nutritional components in foodstuffs and their effect on nutrient bioavailability</li> <li>5. evaluate the current research related to up date processing on nutrients content and stability</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Study the scope of the course, process, purpose of food processing and its effect on nutrients</li> <li>2. The effect of high temperature processing, low temperature processing, fermentation and drying on carbohydrates and bioavailability</li> <li>3. The effect of high temperature processing, low temperature processing, fermentation and drying on protein and bioavailability</li> <li>4. The effect of high temperature processing, low temperature processing, fermentation and drying on lipid and bioavailability</li> <li>5. The effect of irradiated food processing and the use of chemicals on carbohydrates and bioavailability</li> <li>6. The effect of irradiated food processing and the use of chemicals on protein and bioavailability</li> <li>7. The effect of irradiated food processing and the use of chemicals on lipid and bioavailability</li> <li>8. The effect of food processing with high temperature, low temperature and drying on water-soluble vitamins and bioavailability</li> <li>9. The effect of fermented food processing, irradiation and the use of chemicals on water-soluble vitamins and bioavailability</li> <li>10. The effect of food processing with high temperature, low temperature and drying on fat-soluble vitamins and bioavailability</li> </ol>

	<ol style="list-style-type: none"> <li>11. The effect of fermented food processing, irradiation and the use of chemicals on fat-soluble vitamins and bioavailability</li> <li>12. The effect of food processing with high temperature, low temperature and drying on major minerals and bioavailability</li> <li>13. The effect of fermented food processing, irradiation and the use of chemicals on major minerals and bioavailability</li> <li>14. The effect of food processing with high temperature, low temperature, drying, fermentation, irradiation and the use of chemicals on trace minerals and bioavailability</li> </ol>
<b>Examination forms</b>	<ol style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Individual essay exams</li> <li>3. Presentation on project</li> </ol>
<b>Reading List</b>	<ol style="list-style-type: none"> <li>1. Richardson, P., 2005. Improving the Thermal Processing of foods. CRC Press. Woodhead Publishing Limited. Cambridge.</li> <li>2. Richardson, P., 2006. Thermal process in Food Processing. CRC Press. Woodhead Publishing Limited. Cambridge.</li> <li>3. Kennedy, C. J., 2005. Managing Frozen Foods. Woodhead Publishing Limited. Cambridge, England. Pp. 123-135.</li> <li>4. Sikorski, Z. E., 2006. Chemical and Functional Properties of Food Proteins. Technomic Publishing. Co. Base.</li> <li>5. Sikorski, Z. E., 2006. Chemical and Functional Properties of Food Saccharides. Technomic Publishing. Co. Base.</li> <li>6. Sikorski, Z. E., 2006. Chemical and Functional Properties of Food Lipids. Technomic Publishing. Co. Base.</li> <li>7. Man, C. M. D. and A.A. Jones, 2000. Self live Evaluation of Foods. Blackie Academic &amp; Professional. London.</li> <li>8. Farnworth, E. R. 2006. Handbook of Fermented Functional Foods. Functional Foods and Nutraceuticals Series. CRC Press. Boca Raton.</li> <li>9. Jurnal-Jurnal Scopus dan Thomson Index (lima tahun ke belakang)</li> </ol>

Module designation	<i>Agricultural Industry Biotechnology</i>
Semester (s) in which the module is taught	6 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Dr. rer. nat. Ir. Agus Wijaya, M.Si.</li> <li>2. Ir. Nura Malahayati, M.Sc., Ph.D.</li> <li>3. Sugito, S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Elective course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	<i>Biochemistry II</i>
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the basic elements of microbial genetic engineering, including DNA, the responsible enzymes and cloning vectors.</li> <li>2. understand principles of genetic engineering, including its analysis techniques</li> <li>3. explain some important application in biotechnology</li> <li>4. understand how nutrition affects genome</li> <li>5. know current issues in agricultural biotechnology</li> <li>6. understand regulation on biotechnology products</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction to biotechnology (definition, scope and application)</li> <li>2. DNA, gene and its expression</li> <li>3. DNA-modifying enzymes</li> <li>4. Cloning vectors</li> <li>5. Fundamentals of microbial genetic engineering</li> <li>6. Safety aspects of transgenic foods</li> <li>7. Analysis techniques on DNA level</li> <li>8. Current issues in biotechnology</li> <li>9. Immobilized enzymes</li> <li>10. Biotransformation</li> <li>11. Protein engineering</li> <li>12. Nutrigenomics</li> <li>13. Regulation on biotechnology products</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Essay exams</li> <li>3. Multiple choice exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Brown, T.A. 2020. Gene Cloning and DNA Analysis: an Introduction. 8th Edition. Wiley-Blackwell.</li> </ol>



Module designation	<i>Applied Computer</i>
Semester (s) in which the module is taught	6 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	1. Hermanto, S.TP., M.Si. 2. Farry Apriliano Haskari, S.TP., M.Si.
Language	Indonesian
Relation to curriculum	Elective course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	6 hours and 20 minutes of total workload: 100 minutes for Contact Study; 160 Minutes for practicum, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	3 credits (equivalent with 4.8 ECTS)
Required and recommended prerequisite for joining the module	-----
Module objectives/intended learning outcomes	After completing the course, students will be able to: <ol style="list-style-type: none"> <li>1. understand the concepts of algorithms, flowcharts and pseudocode and their use in making computer programs specifically in Quick Basic</li> <li>2. understand the quick basic programming language environment</li> <li>3. differentiate the use of data types, constants and variables in programming</li> <li>4. understand and apply the meaning of array variables and their application, the types of operators and functions in the quick basic program, the types of control commands</li> <li>5. understand the concept of creating a data file and its application</li> <li>6. design programming data files and menu program</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Quickbasic programming language environment</li> <li>2. Data type: Constants and variables</li> <li>3. simple variables and array variables operators and functions</li> <li>4. Types of Control Commands:</li> <li>5. Control command Procedure /subroutine</li> <li>6. the concept of creating a data file and its application</li> <li>7. Designing programming data files and program menu</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Multiple choice exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Alexandra I. Forsythe., Thomas A.Keenan., Elliot I. Organick., Wren Stenderg. 1969. Computer Science. John Wiley &amp; Sons, Inc., First Edition.</li> <li>2. Autar ,K. Kaw, Egwu E. Kalu, dan Duc Nguyen. 2011. Numerical Methods with Applications, 2nd Edition. . ISBN-10: 0578057654. 740p.</li> <li>3. Byron S. Gottfried. 1975. Theory and Problem of Programming with Basic. Scaum's Outline series. McGraw-Hill Book Company, First edition.</li> <li>4. Damji, Faraaz ., Adam Colton., dan Gareth Richardson . 2013. QBasic . Wikibook</li> </ol>

5. Dyakonov, Vladimir dan . Victor DjakonovVictor Djakonov. 1996. Revolutionary Guide to QBASIC. 1996. ISBN -101874416206., ISBN-13 9781874416203. Wrox Press Published. 577p.
6. Goldstein, Larry Joel. Hand –On Quick Basic. Simon & Scuster, Inc. USA. 549p.
7. Gordon B. Davis. 1981. Introduction to Computer. McGraw-Hill Kogakusha, International Studet Edition, Third Edition.
8. Niklaus Wirth. 2012. Algorithms and Data Structures. Prentice Hall. ISBN-10: 0130220051., ISBN-13: 978-0130220059 . 288p.
9. Robert C Nickerson . 1995. Fundamentals of QBASIC Programming: Problem Solving and Application Development. Addison-Wesley Educational Publishers. ISBN-13: 9780673993786. 401p

Module designation	<i>Food Fortification Technology</i>
Semester (s) in which the module is taught	6 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Ir. Nura Malahayati, M.Sc., Ph.D.</li> <li>2. Dr. Merynda Indriyani Syafutri, S.TP., M.Si.</li> <li>3. Dr. Eka Lidiasari, S.TP., M.Si.</li> </ol>
Language	Indonesian
Relation to curriculum	Elective course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-----
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the principles of food fortification</li> <li>2. identify how to increase the nutritional value of food through various fortification techniques that include fortification of vitamins and minerals, fortification of substances other than vitamins and minerals (polyphenols, carotenoids, fatty acids and phytosterols)</li> <li>3. analyze stability and analysis of fortificants, as well as knowing the regulation and safety of fortifications through reviewing the up date jurnal</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Food fortification as a programme of nutrition intervention</li> <li>2. Basic principles of food fortification (terminology, types of fortification, legal consideration mandatory versus voluntary)</li> <li>3. Design of fortification programmes (Case Wheat Flour Fortification) (identification of nutrient to be added and the target group for the fortified food, selection of foods to reach vulnerable groups, and level of nutrients to be added)</li> <li>4. Technical aspects of micronutrient addition to foods</li> <li>5. Main methods of food fortification</li> <li>6. A principles of assay procedures (analyses of fortificant, bioavailability assessment)</li> <li>7. Implementation of a fortification programme Ex. Flour Fortification (Wheat Flour, Maize etc., Rice Fortification (Ultra©Rice etc.), Noodles Fortification (Asian Noodle, Rice Noodle, Vermicelli etc.), Bread, Cookies etc., Sugar Fortification, Cooking oil fortification, Complementary Food Fortification (Juice, Milk etc.), and Salt Fortification</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Assignments</li> <li>2. Individual essays exam</li> <li>3. Presentation on project</li> </ol>

Reading List

1. Johnson, Q., Mannar, V. and Ranum, P. 2004. Fortification Handbook: Vitamin and Mineral Fortification of Wheat Flour and Maize Meal. The Micronutrient Initiative.
2. Alle, L., Benoist, B., Dary, O. and Hurrell, R. 2006. Guidelines on food fortification with micronutrients. World Health Organization and Food and Agriculture Organization of the United Nations.
3. Micronutrient Initiative. 2003. Fortification Rapid Assessment Tool (FRAT). Adapted from the FRAT guidelines (2000) originally prepared by PATH Canada and commissioned by MI.
4. Bogor Agricultural University, et.al. 2003. Country Investment Plan for Food Fortification In Indonesia. Bogor Agricultural University In Collaboration with Asian Development Bank, Manila The Keystone Center, USA

Module designation	<i>Food Enzyme Technology</i>
Semester (s) in which the module is taught	6 <sup>th</sup> semester/3 <sup>th</sup> year
Person responsible for the module	1. Dr. Ir. Anny Yanuriati, M.Appl.Sc. 2. Dr. Ir. Tri Wardani Widowati, M.P.
Language	Indonesian
Relation to curriculum	Elective course
Teaching methods	Face to face Lecturing, E-Learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-----
Module objectives/intended learning outcomes	<p>After completing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the principles of Enzymology and Food Enzyme Technology</li> <li>2. understand and explain the morphology, structure, nomenclature and classification of enzyme</li> <li>3. understand and explain the Immobilization Technology of Enzyme</li> <li>4. understand and explain the factors in stabilization, Activity, catalytic mechanism, kinetics mechanism of enzyme.</li> <li>5. understand and explain the Carbohydrase, Proteases, Lipases: specific reactions, important/specific enzymes, extraction and purification of enzyme</li> <li>6. understand and explain the application of enzymes in the various of food industries</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction: Explanation of course CP and how to achieve it for one semester; Relationship of Enzymology and Food Enzyme Technology</li> <li>2. Morphology, Structure and Nomenclature: Enzyme structure, Enzyme morphology (Apoenzyme, Holoenzyme, Prosthetic Cluster), Catalytic Side and Binding Site, System Nomenclature, and Classification of enzymes according to how they work</li> <li>3. Immobilized Enzymes (Immobilization Technology): Physical Immobilization; Chemical Immobilization</li> <li>4. Factors in Stabilization and Activity: Temperature, pH, water content, salt concentration; Competitive and non-competitive inhibitors</li> <li>5. Mechanism of Enzyme Catalysis and Kinetics: Enzymatic reaction, catalytic mechanism, determine V<sub>max</sub> and K<sub>m</sub>, and enzyme reaction kinetics (to determine V<sub>max</sub> and K<sub>m</sub>)</li> <li>6. Carbohydrase: Enzymes that hydrolyze carbohydrates (specific reactions) and enzymes important in the food industry, extraction purification and application</li> </ol>

	<ol style="list-style-type: none"> <li>7. Proteases: Enzymes that hydrolyze proteins (specific reactions) and important enzymes in the food industry, extraction, purification and applications</li> <li>8. Lipases: Enzymes that hydrolyze lipids (specific reactions) and important enzymes in the food industry, extraction, purification and application</li> <li>9. Enzyme applications in the food industry: Bakery industry, cheese production, fermented products, meat tenderization, and fruit and vegetable processing</li> <li>10. Presentation and discussion</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Oral presentation</li> <li>2. Essays exams</li> <li>3. Multiple choice exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Whitaker, J.R., A.G.J. Voragen, and D.W.S. Wong (ed.), 2003. Handbook of food enzymology. Marcel Dekker, Inc. New York.</li> <li>2. Kuddus, M.(Ed). 2018. Enzyme in food technology. Improvements and innovations. Springer Nature Pte. Ltd..</li> <li>3. Whitehurst, R.J. and M.V. Oort. 2010. Enzymes in Food Technology. Blackwell Publishing. Ltd.</li> </ol>

Module designation	<i>Oil Palm Downstream Technology</i>
Semester (s) in which the module is taught	7 <sup>th</sup> semester/4 <sup>th</sup> year
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Sugito, S.TP., M.Si.</li> <li>2. Friska Syaiful, S.TP., M.Si.</li> <li>3. Dr. Ir. Kiki Yuliati, M.Sc.</li> </ol>
Language	Indonesian
Relation to curriculum	Elective course
Teaching methods	Lectures and independent-project learning
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-----
Module objectives/intended learning outcomes	<p>After completing this course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand various products made of palm oil</li> <li>2. understand the main chemical, physical and biochemical characteristics of palm oil</li> <li>3. identify the main and current processing technologies used to process palm oil</li> <li>4. understand current technology development and challenges in processing palm oil for the future</li> <li>5. apply their understanding on current processing technologies development and challenges to create innovative product made of palm oil.</li> <li>6. evaluate the technological challenges they may face in developing their product idea.</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Indonesian palm oil processing development</li> <li>2. Global palm oil processing development</li> <li>3. Latest development of palm oil processing technology</li> <li>4. Process innovation to increase the competitiveness of the palm oil agroindustry</li> <li>5. PKO (Palm Kernel Oil) processing technology</li> <li>6. Oleochemical and emulsifier process technology</li> <li>7. Extraction of carotenoids and other micro nutrients from palm oil</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Project Assignments</li> <li>2. Individual Project Exam</li> <li>3. Presentation on Projects</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Dominic C. Y. Foo and Mustafa Kamal Tun Abdul Aziz (Eds). 2019. Green Technologies for the Oil Palm Industry. Springer Nature Singapore Pte Ltd.</li> </ol>

Module designation	<i>Polymer Technology</i>
Semester (s) in which the module is taught	7 <sup>th</sup> semester/4 <sup>th</sup> year
Person responsible for the module	1. Prof. Ir. Filli Pratama, M.Sc., (Hons)., Ph.D. 2. Dr. Ir. Anny Yanuriati, M.Appl.Sc.
Language	Indonesian
Relation to curriculum	Elective course
Teaching methods	Face to face lecturer, project
Workload (incl. Contact hours, self-study hours)	5 hours and 40 minutes of total workload: 100 minutes for Contact Study, 120 minutes for structured academic assignment and 120 minutes for self-study per week
Credit points	2 credits (equivalent with 3.2 ECTS)
Required and recommended prerequisite for joining the module	-----
Module objectives/intended learning outcomes	<p>After completing this course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand various source potential biopolymers for food application</li> <li>2. understand the main chemical, physical and functional characteristics of some source potential biopolymers for food application</li> <li>3. identify the main and current processing technologies used to isolate and modify some biopolymers</li> <li>4. understand the characteristic and functional changes of modified biopolimer</li> <li>5. understand current technology development and challenges in processing biopolymers for the future</li> <li>6. apply on current processing technologies development and challenges to create innovative product made of biopolymer.</li> </ol>
Content	<ol style="list-style-type: none"> <li>1. Introduction of science and polymer technology development</li> <li>2. Cellulose: potential source, type, structure, physical and chemical characteristics, some isolation and modification technics, functional properties and its application</li> <li>3. Chitin and Chitosan: potential source, type, structure, physical and chemical characteristics, some isolation and modification :technics, functional properties and its application</li> <li>4. Agar:potential source, type, structure, physical and chemical characteristics, some isolation and modification technics, functional properties and its application</li> <li>5. Carragenan: potential source, type, structure, physical and chemical characteristics, some isolation and modification technics, functional properties and its application</li> <li>6. Glucomannan: potential source, type, structure, physical and chemical characteristics, some isolation and modification technics, functional properties and its application</li> <li>7. Pectin : potential source, type, structure, physical and chemical characteristics, some isolation and modification technics, functional properties and its application</li> </ol>



	<ol style="list-style-type: none"> <li>8. Alginate: potential source, type, structure, physical and chemical characteristics, some isolation and modification technics, functional properties and its application</li> <li>9. Gelatin: potential source, type, structure, physical and chemical characteristics, some isolation and modification technics, functional properties and its application</li> <li>10. Gum arabic: potential source, type, structure, physical and chemical characteristics, some isolation and modification technics, functional properties and its application</li> </ol>
Examination forms	<ol style="list-style-type: none"> <li>1. Essay Assignments</li> <li>2. Essays exams</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Phillips J.O. and Williams, P.A. 2009. Handbooks of hydrocolloids. Woodhead Publishing Ltd and CRC Press LLC.</li> <li>2. Some related Journals on biopolymers</li> </ol>

Module designation	<i>Field Practice</i>
Semester (s) in which the module is taught	7 <sup>th</sup> semester/4 <sup>th</sup> year
Person responsible for the module	Study Program Lecturer Team
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Project based learning
Workload (incl. Contact hours, self-study hours)	The duration of the Field Practice is equivalent to activities of minimal 30 days (4 weeks) in location
Credit points	3 credits (equivalent with 8.16 ECTS)
Required and recommended prerequisite for joining the module	Fulfilled at least 105 credits
Module objectives/intended learning outcomes	<p><b>After completing this course, students will have the following Attitudes and Values:</b></p> <ol style="list-style-type: none"> <li>1: upholding human values in carrying out duties based on religion, morals, and ethics</li> <li>2: work together and have social sensitivity and concern for society and the environment</li> <li>3: internalize academic values, norms, and ethics</li> <li>4: demonstrate a responsible attitude towards work in their field of expertise independently</li> </ol> <p><b>After completing this course, students will have the following Knowledge Ability</b></p> <ol style="list-style-type: none"> <li>1: demonstrate oral and written communication skills related to the technical and non-technical aspects</li> <li>2: think critically, identify the root of the problem and solve it comprehensively, and make the right decisions based on analysis of information and data</li> <li>3: has professional integrity and is committed to ethical values</li> <li>4: have an attitude to life-long learning</li> <li>5: lead and work in a team, independent and responsible for his work.</li> <li>6: cooperate with individuals who have diverse social and cultural backgrounds</li> <li>7: searching, tracing, extracting scientific and non-scientific information independently and critically</li> <li>8: adapt to the situation at hand and handle various activities simultaneously in various condition</li> </ol> <p><b>After completing this course, students will have the following Specific Capability:</b></p> <ol style="list-style-type: none"> <li>1: able to conduct research on the combination of operations for processing agricultural products, so that they can produce safe and quality agricultural products along the agricultural production chain, and can provide added value to agricultural products</li> </ol>

	<p>2: able to analyze problems with agricultural products technology approach in solving production problems and agricultural products so that they are efficient, safe, and with guaranteed quality</p> <p><b>After completing this course, students will have the following General Capability:</b></p> <p>1: able to apply logical, critical, systematic, and innovative thinking in the context of the development or implementation of science and technology that pay attention to and applies humanities values in accordance with their field of expertise</p> <p>2: able to demonstrate independent, quality, and measureable performance</p> <p>3: able to examine the implications of developing or implementing science and technology that pay attention to and applies humanities values according to their expertise based on scientific principles, procedures and ethics in order to produce solutions, ideas, designs or art criticism</p> <p>4: able to compile a scientific description of the results of the studies mentioned above in the form of a thesis or final project report, and upload it on the university website</p> <p>5: able to maintain and develop a network with supervisors, colleagues. Colleagues both inside and outside the institution</p> <p>6: capable of documenting, storing, securing, and retrieving data to ensure validity and prevent plagiarism</p>
Content	Field practice is a course aimed at providing students with a learning experience in order to deepen and/or expand their knowledge in a contextual manner and is carried out by the Agricultural Product Technology Study Program in coordination with the Agricultural Faculty.
Examination forms	<ol style="list-style-type: none"> <li>1. Oral Examination</li> <li>2. <i>Field Practice</i> Report</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Handbook for writing scientific papers, Faculty of Agriculture, the Sriwijaya University.</li> <li>2. References that related to the field practices topic</li> </ol>

Module designation	<i>Community Service Program</i>
Semester (s) in which the module is taught	7 <sup>th</sup> semester/4 <sup>th</sup> year
Person responsible for the module	Field supervisor
Language	Indonesian
Relation to curriculum	Elective course
Teaching methods	Community based learning or service learning
Workload (incl. Contact hours, self-study hours)	The duration of the <i>Community Service Program</i> is equivalent to activities of 40 days in the location.
Credit points	4 credits (equivalent with 6.4 ECTS)
Required and recommended prerequisite for joining the module	Fulfilled at least 105 credits
Module objectives/intended learning outcomes	<p><b>After completing this course, students will have the following Attitudes and Values:</b></p> <ol style="list-style-type: none"> <li>1: fear Good Almighty and be able to show a religious attitude</li> <li>2: upholding human values in carrying out duties based on religion, morals, and ethics</li> <li>3: contribute to improving the quality of life in society, nation, state, and the progress of civilization based on Pancasila</li> <li>4: work together and have social sensitivity and concern for society and the environment</li> <li>5: obey the law and discipline in social and state life</li> <li>6: internalize academic values, norms, and ethics</li> <li>7: demonstrate a responsible attitude towards work in their field of expertise independently</li> <li>8: internalize the spirit of independence, struggle, and entrepreneurship</li> </ol> <p><b>After completing this course, students will have the following Knowledge Ability:</b></p> <ol style="list-style-type: none"> <li>1: demonstrate oral and written communication skills related to the technical and non-technical aspects</li> <li>2: think critically, identify the root of the problem and solve it comprehensively, and make the right decisions based on analysis of information and data</li> <li>3: has professional integrity and is committed to ethical values</li> <li>4: have an attitude to life-long learning</li> <li>5: lead and work in a team, independent and responsible for his work.</li> <li>6: cooperate with individuals who have diverse social and cultural backgrounds</li> <li>7: searching, tracing, extracting scientific and non-scientific information independently and critically</li> <li>8: adapt to the situation at hand and handle various activities simultaneously in various condition</li> </ol>

	<p><b>After completing this course, students will have the following Specific Capability:</b></p> <ol style="list-style-type: none"> <li>1: able to conduct research on the combination of operations for processing agricultural products, so that they can produce safe and quality agricultural products along the agricultural production chain, and can provide added value to agricultural products</li> <li>2: able to analyze problems with agricultural products technology approach in solving production problems and agricultural products so that they are efficient, safe, and with guaranteed quality</li> </ol> <p><b>After completing this course, students will have the following General Capability:</b></p> <ol style="list-style-type: none"> <li>1: able to apply logical, critical, systematic, and innovative thinking in the context of the development or implementation of science and technology that pay attention to and applies humanities values in accordance with their field of expertise</li> <li>2: able to demonstrate independent, quality, and measureable performance</li> <li>3: able to examine the implications of developing or implementing science and technology that pay attention to and applies humanities values according to their expertise based on scientific principles, procedures and ethics in order to produce solutions, ideas, designs or art criticism</li> <li>5: able to make appropriate decisions in the context of solving problems in their area of expertise, based on the results of analysis of information and data</li> <li>6: able to maintain and develop a network with supervisors, colleagues. Colleagues both inside and outside the institution</li> <li>7: able to be responsible for the achievement of group work results and supervise and evaluate the completion of work assigned to workers under their responsibility</li> <li>8: able to carry out the process of self-evaluation of the work group under their responsibility, and able to manage learning independently</li> </ol>
Content	<p>Community Service Program is a course aimed at providing students with a learning experience in order to apply their mastery of knowledge and skills to contribute to building community in the village or sub-district. This program is carried out in coordination with research and community service institutions of Sriwijaya University, Agricultural Faculty, and Agricultural Product Technology Study Program.</p>
Examination forms	<ol style="list-style-type: none"> <li>1. Oral Presentation of project</li> <li>2. Project Report</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Handbook for the implementation of the Sriwijaya University Community Service Program</li> <li>2. References related to the <i>Community Service Project</i></li> </ol>

Module designation	<i>Internship</i>
Semester (s) in which the module is taught	7 <sup>th</sup> semester/4 <sup>th</sup> year
Person responsible for the module	Study Program Lecturer Team
Language	Indonesian
Relation to curriculum	Elective course
Teaching methods	Community based learning or service learning
Workload (incl. Contact hours, self-study hours)	The duration of the <i>Internship</i> program is equivalent to activities of 30 – 60 days (4 – 8 weeks) in location
Credit points	4 credits (equivalent with 6.4 ECTS)
Required and recommended prerequisite for joining the module	Fullfil at least 105 credits
Module objectives/intended learning outcomes	<p><b>After completing this course, students will have the following Attitudes and Values:</b></p> <ol style="list-style-type: none"> <li>1: fear Good Almighty and be able to show a religious attitude</li> <li>2: upholding human values in carrying out duties based on religion, morals, and ethics</li> <li>3: contribute to improving the quality of life in society, nation, state, and the progress of civilization based on Pancasila</li> <li>4: work together and have social sensitivity and concern for society and the environment</li> <li>5: obey the law and discipline in social and state life</li> <li>6: internalize academic values, norms, and ethics</li> <li>7: demonstrate a responsible attitude towards work in their field of expertise independently</li> <li>8: internalize the spirit of independence, struggle, and entrepreneurship</li> </ol> <p><b>After completing this course, students will have the following Knowledge Ability:</b></p> <ol style="list-style-type: none"> <li>1: demonstrate oral and written communication skills related to the technical and non-technical aspects</li> <li>2: think critically, identify the root of the problem and solve it comprehensively, and make the right decisions based on analysis of information and data</li> <li>3: has professional integrity and is committed to ethical values</li> <li>4: has an attitude to life-long learning</li> <li>5: lead and work in a team, independent and responsible for his work.</li> <li>6: cooperate with individuals who have diverse social and cultural backgrounds</li> <li>7: searching, tracing, extracting scientific and non-scientific information independently and critically</li> <li>8: adapt to the situation at hand and handle various activities simultaneously in various condition</li> </ol>

	<p><b>After completing this course, students will have the following Specific Capability:</b></p> <ol style="list-style-type: none"> <li>1: able to conduct research on the combination of operations for processing agricultural products, so that they can produce safe and quality agricultural products along the agricultural production chain, and can provide added value to agricultural products</li> <li>2: able to analyze problems with agricultural products technology approach in solving production problems and agricultural products so that they are efficient, safe, and with guaranteed quality</li> </ol> <p><b>After completing this course, students will have the following General Capability:</b></p> <ol style="list-style-type: none"> <li>1: able to apply logical, critical, systematic, and innovative thinking in the context of the development or implementation of science and technology that pay attention to and applies humanities values in accordance with their field of expertise</li> <li>2: able to demonstrate independent, quality, and measureable performance</li> <li>3: able to examine the implications of developing or implementing science and technology that pay attention to and applies humanities values according to their expertise based on scientific principles, procedures and ethics in order to produce solutions, ideas, designs or art criticism</li> <li>4: able to make appropriate decisions in the context of solving problems in their area of expertise, based on the results of analysis of information and data</li> <li>5: able to maintain and develop a network with supervisors, colleagues. Colleagues both inside and outside the institution</li> <li>6: able to be responsible for the achievement of group work results and supervise and evaluate the completion of work assigned to workers under their responsibility</li> <li>7: able to carry out the process of self-evaluation of the work group under their responsibility, and able to manage learning independently</li> </ol>
Content	<p>Internship is a course aimed at providing students with work experience carried out in organizations or industries in the field of work or tasks that are relevant to the scientific field of study and is carried out by the Agricultural Product Technology Study Program in coordination with the Agricultural Faculty.</p>
Examination forms	<ol style="list-style-type: none"> <li>1. Oral Examination</li> <li>2. Assessment from field supervisor</li> <li>3. Internship Report</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Handbook for writing scientific papers, Faculty of Agriculture, the Sriwijaya University.</li> <li>2. References related to the <i>Internship</i> topic</li> </ol>

Module designation	Final Project
Semester (s) in which the module is taught	8 <sup>th</sup> semester/4 <sup>th</sup> year
Person responsible for the module	Study Program Lecturer Team
Language	Indonesian
Relation to curriculum	Compulsory Course
Teaching methods	Project based learning
Workload (incl. Contact hours, self-study hours)	The duration of the Final Project is equivalent to activities of 6 months.
Credit points	6 credits (equivalent with 9.6 ECTS)
Required and recommended prerequisite for joining the module	Fulfilled at least 105 Credit hours
Module objectives/intended learning outcomes	<p><b>After completing this course, students will have the following Attitudes and Values:</b></p> <ol style="list-style-type: none"> <li>1: fear Good Almighty and be able to show a religious attitude</li> <li>2: upholding human values in carrying out duties based on religion, morals, and ethics</li> <li>3: contribute to improving the quality of life in society, nation, state, and the progress of civilization based on Pancasila</li> <li>4: act as citizens who are proud and love their homeland, have nationalism and a sense of responsibility to the country and nation</li> <li>5: respect the diversity of cultures, views, religions, and beliefs, as well as the opinions or original findings of others</li> <li>6: work together and have social sensitivity and concern for society and the environment</li> <li>7: obey the law and discipline in social and state life</li> <li>8: internalize academic values, norms, and ethics</li> <li>9: demonstrate a responsible attitude towards work in their field of expertise independently</li> <li>10: internalize the spirit of independence, struggle, and entrepreneurship</li> </ol> <p><b>After completing this course, students will have the following Knowledge Ability</b></p> <ol style="list-style-type: none"> <li>1: mastering the principles of chemistry and analysis of food and agricultural product</li> <li>2: mastering the principles of microbiology and food safety</li> <li>3: mastering the principles of engineering and processing of food and agricultural product</li> <li>4: mastering the principles of applied sciences of food and agricultural product</li> <li>5: mastering the principles of biochemistry of food and nutrition</li> <li>6: having success skill (communication skills, critical thinking/problem solving, professional, longlife learning, interaction, information</li> </ol>



**After completing this course, students will have the following Specific Capability:**

- 1: able to design agricultural product production process based on the application of technology principles and agricultural product processing in an effective, efficient, and precise manner so as to produce a well-standardized production process
- 2: able to design the development of agricultural products that meet the quality criteria of agricultural products, are safe, nutritious and/or useful based on the principles of agricultural technology
- 3: able to conduct research on the combination of operations for processing agricultural products, so that they can produce safe and quality agricultural products along the agricultural production chain, and can provide added value to agricultural products
- 4: able to analyze problems with agricultural products technology approach in solving production problems and agricultural products so that they are efficient, safe, and with guaranteed quality
- 5: able to design agricultural product packaging in order to protect and maintain product durability and quality, as well as safe, with informative labels for consumers in accordance with regulations and laws related to agricultural products
- 6: able to provide added value to agricultural products with Indonesian characteristics, especially the Southern part of Sumatera with locally-based agricultural products and optimal utilization of Indonesia's biological diversity through production processes that are safe, standardized, efficient, and effective

**After completing this course, students will have the following General Capability:**

- 1: able to apply logical, critical, systematic, and innovative thinking in the context of the development or implementation of science and technology that pay attention to and applies humanities values in accordance with their field of expertise
- 2: able to demonstrate independent, quality, and measureable performance
- 3: able to examine the implications of developing or implementing science and technology that pay attention to and applies humanities values according to their expertise based on scientific principles, procedures and ethics in order to produce solutions, ideas, designs or art criticism
- 4: able to compile a scientific description of the results of the studies mentioned above in the form of a thesis or final project report, and upload it on the university website
- 5: able to make appropriate decisions in the context of solving problems in their area of expertise, based on the results of analysis of information and data
- 6: able to maintain and develop a network with supervisors, colleagues. Colleagues both inside and outside the institution
- 7: able to be responsible for the achievement of group work results and supervise and evaluate the completion of work assigned to workers under their responsibility

	<p>8: able to carry out the process of self-evaluation of the work group under their responsibility, and able to manage learning independently</p> <p>9: capable of documenting, storing, securing, and retrieving data to ensure validity and prevent plagiarism</p> <p>10: Capable of making quick adaptation to working environment.</p>
Content	<p>The final project aims to provide students with experience and ability in formulating a problem and its solution in the form of a student's independent scientific work that is relevant the scientific field of study and is carried out by the Agricultural Product Technology Study Program in coordination with the Agricultural Faculty.</p>
Examination forms	<ol style="list-style-type: none"> <li>1. Oral Presentation</li> <li>2. Oral Examination</li> <li>3. Final project Report</li> </ol>
Reading List	<ol style="list-style-type: none"> <li>1. Handbook for writing scientific papers, Faculty of Agriculture, the Sriwijaya University</li> <li>2. References related to the final project topic</li> </ol>