



MODULE HANDBOOK

Bachelor Programme in Food
Science and Technology (BPFST)

2025



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Module Description

Indonesia Language

Module designation	Indonesia Language
Module code	23U01110902
Semester(s) in which the module is taught	1 st semester
Person responsible for the module (lecturers)	❖ Dr. Inriati Lewa, M.Hum ❖ Nawir, S.S., M.Hum
Language	Indonesian language
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards (S)
	CLO 1. Students take pride in using Indonesian in national and international communication related to religious, national, diversity, and maritime values as independent individuals with character and a spirit of social sensitivity, struggle, and entrepreneurship through the use of Indonesian. CLO 2. Students are able to identify religious, national, diversity, and maritime values in Indonesian texts in accordance with the rules of EYD Edition V. CLO 3. Students are able to think critically, systematically, innovatively, and integrally; communicate effectively; and work independently or in teams in writing scientific papers.
Content	❖ History, position, and function of the Indonesian language ❖ Varieties of the Indonesian language ❖ Enhanced Spelling System (EYD) edition V



	❖ Effective sentences ❖ Paragraph formation ❖ Planning scientific papers (topic titles and essay outlines) ❖ Writing scientific papers (articles, papers, proposals) ❖ Citation system and bibliography																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% Assessment: ❖ Individual assignment: 20% ❖ Case study: 25% ❖ Project-based learning: 55% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Anggaraini, Asih, dkk.2006. <i>Mengasah Keterampilan Menulis Ilmiah di Perguruan Tinggi</i>. Yogyakarta: Graha Ilmu. 2. Abidin, Yunus, dkk. 2017. <i>Kemahiran Berbahasa Indonesia untuk Perguruan Tinggi</i>. Bandung: PT Bumi Aksara. 3. Chaer, Abdul. 2016. <i>Tata Bahasa Praktis Bahasa Indonesia</i>. Jakarta: Rineka Cipta. 4. Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan Republik Indonesia. 2013. <i>Modul Mata Kuliah Bahasa Indonesia</i>. Jakarta 5. Finoza, Lamuddin. 2001. <i>Komposisi Bahasa Indonesia</i>. Jakarta: Diksi Insan Mulia.																														



	6. Kurniawan, Khaeruddin. 2012. <i>Bahasa Indonesia Keilmuan untuk Perguruan Tinggi</i>. Bandung: PT Refika Aditama. 7. Nurjamal, Daeng, Warta Sumirat, dan Riadi Darwis. 2014. <i>Terampil Berbahasa</i>. Bandung: Alfabeta. 8. Sri Nugraheni, Aninditya dan Muhammad Rohmani. 2011. <i>Belajar Bahasa Indonesia: Upaya Terampil Berbicara dan Menulis Karya Ilmiah</i>. Surakarta: Cakra Media. 9. Wiyanto, Asul. 2004. <i>Terampil Menerapkan Kaidah Ejaan Bahasa Indonesia</i>. Jakarta. Grasindo. 10. Widjono H. S. 2005. <i>Bahasa Indonesia</i>. Jakarta: PT Grasindo. 11. Alwi, Hasan, dkk. 2000. <i>Tata Bahasa Baku Bahasa Indonesia: Edisi Ketiga</i>. Jakarta: Departemen Pendidikan dan Kebudayaan. 12. Arifin, E. Zainal. 2006. <i>Dasar-dasar Penulisan Karya Ilmiah</i>. Jakarta: PT Grasindo. 13. Arifin, E. Zainal & S. Amran Tasai. 2008. <i>Cermat Berbahasa Indonesia: untuk Perguruan Tinggi</i>. Jakarta: Akademika Pressindo. 14. Departemen Pendidikan Nasional. 2022. <i>Pedoman Umum Ejaan Bahasa Indonesia edisi V dan Pedoman Umum Pembentukan Istilah</i>. Jakarta: Pusat Bahasa
Date of last amendment	6 August 2025



Module Description

The insight of Maritime Social and Culture

Module designation	The insight of Maritime Social and Culture
Module code	23U01111002
Semester(s) in which the module is taught	1 st semester
Person responsible for the module (lecturers)	❖ Hardiyanti Munsir, S.Sos., M.Si. ❖ Dr. Nur Haedar, S.Si. , M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of private study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	ILO 1. Demonstrates the ability to act as a responsible citizen who respects diversity based on the national ideology of Indonesia (A) CLO 1. Students are able to internalize cultural values and science, technology, and art (IPTEKS) that are humanistic and environmentally conscious based on the maritime continent of Indonesia. CLO 2. Students are able to describe cultural values and maritime IPTEKS based on the maritime continent of Indonesia as independent and characterful individuals who possess a spirit of social sensitivity. CLO 3. Students are able to think critically, systematically, and innovatively, and communicate effectively regarding cultural insights and IPTEKS based on Indonesia's maritime continent that is humanistic and environmentally wise.
Content	❖ Vision and Concept of the Indonesian Maritime Continent (BMI). ❖ Geography and Potential of Marine Natural Resources of the Indonesian Maritime Continent.



	❖ Maritime History, Society, and Institutions ❖ Maritime Culture and Cultural Values. ❖ Concepts of Knowledge, Science, and Technology, and the Relationship Between Science and Technology. ❖ Technological Development and Its Impact. ❖ Concepts of Art and Beauty, and Their Relationship with Science and Technology. ❖ Integrity and Ethics in Science, Technology, and Innovation (STI), and the Influence of STI Development on Resource Management in Preserving the BMI Environment.																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Collaborative learning: 20% ❖ Case study: 38% ❖ Project-based learning: 42% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
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70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Lampe, M. 2022. Buku Ajar Kemaritiman: Wawasan Sosial Budaya Maritim Indonesia. ISBN. 9789795304487. Penerbit Unhas Press. 2. Dewan Hankamnas-BPP Teknologi. 1996. BMI (Benua Maritim Indonesia). Jakarta: Direktorat Teknologi Inventarisasi Sumberdaya Alam. 3. Benardie, Hakim SP. 2003. Sejarah Maritim Indonesia. Proyek Pengkajian Kebijakan Kelautan, Sekretaris Jenderal Departemen Kelautan dan Perikanan RI.																														



	4. Kasim, S. 2017. Filosofi Wawasan Ipteks (Buku Ajar Unhas). ISBN: 978-602-6332-12-7. Pustaka Pena Press.Makassar. 5. Tim Dosen Wawasan Ipteks Unhas, 2013, Buku Ajar Wawasan Ipteks UPT MKU UNHAS, Edisi ke 6. Unhas, Makassar. 6. Usman, H., dkk. 2014. Buku Ajar Wawasan Ipteks (Menggunakan Pendekatan Learning). UPT MKU UNHAS. ISBN:978-602-99757-8-9. Percetakan Offset CV. Gelora.Makassar.
Date of last amendment	8 August 2025



Module Description English

Module designation	English
Module code	23U01111102
Semester(s) in which the module is taught	1 st semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Fathu Rahman, M.Hum. ❖ Hasria Riski, S.Si. , M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of private study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards (S)
	CLO 1. Students are able to internalize academic values, norms, and ethics in improving the quality of life, progress in society, nation, state, and civilization. CLO 2. Students are able to compose English sentences in accordance with English grammar rules. CLO 3. Students are able to analyze information in English texts. CLO 4. Students are able to communicate effectively in English in academic and everyday contexts.
Content	❖ Concept and Importance of English Communication ❖ Parts of Speech ❖ English Tenses ❖ Reading Strategies ❖ Expressing Ideas in English ❖ English Public Speaking Activities
Examination form	Writing (essay)



Study and examination requirements	Examination requirements: Attendance above 80% Lecturer assessment: ❖ Individual assignments: 35% ❖ Project-based learning: 65% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Team Teaching. 2022. Modul 1 English Language.Universitas Hasanuddin. 2. Team Teaching. 2022. Modul 2 English Language.Universitas Hasanuddin. 3. Team Teaching. 2022. Modul 3 English Language.Universitas Hasanuddin. 4. Team Teaching. 2022. Modul 4 English language.Universitas Hasanuddin. 5. Team Teaching. 2022. Modul 5 English Language.Universitas Hasanuddin. 6. Team Teaching. 2022. Modul 6 English Language.Universitas Hasanuddin. 7. Team Teaching. 2022. Semester Based Course Plan. Universitas Hasanuddin 8. Boukhatem, A., 2019. Teaching Vocabulary Through Non-Verbal Communication. Abdalhamid Ibn Badis University of Mostaganem Faculty of Foreign languages Department of English 9. Pandarangga, S., 2015. The transformation of English as Global Language in The World.																														



	https://ejournal.uin-malang.ac.id/index.php/humbud/article/view/3132 10. Ahmad, Imtiaz. 2022. Concise Guide English Grammar Parts of Speech. Dera Ghazi Khan: Ghazi University Press. 11. Idaryani. 2015. Bahasa Inggris untuk Perguruan Tinggi. 1st Ed., Aceh Utara: Unimal Press. 12. Sarbunan, Thobias. 2020. 16 Tenses dalam Bahasa Inggris. Ambon: Institut Agama Kristen Ambon (https://www.researchgate.net/publication/343218802_16-tenses-dalam-bahasa-inggris) 13. Mikulecky, Beatrice S. & Jeffries, Linda. 2007. Advanced Reading Power. Pearson Education: New York. 14. Mikulecky, Beatrice S. & Jeffries, Linda. 1996. More Reading Power. Longman: USA. 15. Chivers, Barbara & Shoolbred, Michael. 2007. A Student's Guide to Presentations. Sage Publications: London 16. Grussendorf, Marion. 2011. English for Presentations. Oxford University Press: Oxford. 17. Powell, Mark. 2002. Presenting in English: How to Give Successful Presentations. Thomson Heinle: Croatia. 18. Sullivan, Richard L. & Wircenski, Jerry L. 2010. Technical Presentation Workbook Winning Strategies for Effective Public Speaking . Asme Press: New York. 19. University of Birmingham Library Services. A Short Guide to Presentation Skills. www.intranet.birmingham.ac.uk/asc 20. Carnegie, D. and Esenwein, J.B., 2017. The art of public speaking. Courier Dover Publications. 21. Nikitina, A., 2011. Successful public speaking. Bookboon. 22. Beebe, S.A. and Beebe, S.J., 2010. Public speaking handbook. Allyn & Bacon.
Date of last amendment	7 August 2025



Module Description Basic Mathematics

Module designation	Basic Mathematics									
Module code	23H01110103									
Semester(s) in which the module is taught	1 st semester									
Person responsible for the module (lecturers)	❖ Prof. Dr. Eng. Mawardi, S.Si. , M.Si. ❖ Dra. Nur Erawati, M.Si.									
Language	Indonesian language									
Relation to curriculum	Compulsory									
Teaching methods	Lecture									
Workload	Total workload (estimated): ❖ 40 hours of lecture ❖ 48 hours of exercise ❖ 48 hours of private study									
Credit points	3 credit points = 4.86 ECTS									
Required and recommended prerequisites for joining the module	None									
Module objectives/ Intended Learning Outcomes (ILO)	ILO 2. Demonstrates a comprehensive understanding of theoretical concepts and technological literacy related to food science and technology principles and food law to support professional expertise in food science and technology (K)									
Content	This module delivers material about the real number system, functions and limits, limits and continuity, function derivatives, derivative application, integral, and its application									
Examination form	Writing (essay)									
Study and examination requirements	Examination requirements: Attendance above 80% Lecturer assessment: attendance: 10%, assignment: 30%, presentation: 30%, examination: 30%. Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr></table>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75
Numerical range	Letter grade	Conversion value								
85 - 100	A	4.00								
80 - < 85	A-	3.75								



	75 - < 80	B+	3.50
	70 - < 75	B	3.00
	65 - < 70	B-	2.75
	60 - < 65	C+	2.50
	50 - < 60	C	2.00
	40 - < 50	D	1.00
	< 40	E	0.00
<i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>			
Reading list	Dale Varberg, Edwin Purcell, dan Steve Rigdon, 2011, Calculus 9th edition		
Date of last amendment	4 August 2025		



Module Description Basic Chemistry

Module designation	Basic Chemistry
Module code	23H03112703
Semester(s) in which the module is taught	1 st semester
Person responsible for the module (lecturers)	❖ Dr. Herlina Rasyid, S.Si. ❖ Dr. Nur Asmi, S.Si.
Language	Indonesian language
Relation to curriculum	Compulsory
Teaching methods	Lecture, laboratory practice
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study ❖ 45 hours of laboratory practice
Credit points	3 credit points = 4.86 ECTS
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	ILO 2. Demonstrates a comprehensive understanding of theoretical concepts and technological literacy related to food science and technology principles and food law to support professional expertise in food science and technology (K)
	CLO 1. Have knowledge of facts and theories related to basic chemistry. CLO 2. Have skills in handling chemicals with attention to safety and security in basic chemistry laboratories.
Content	❖ Atomic Structure ❖ Periodic Table of Elements ❖ Chemical Bonding ❖ Stoichiometry ❖ Solutions ❖ Chemical Equilibrium ❖ Acid-Base Equilibrium ❖ Chemical Kinetics ❖ Chemical Thermodynamics ❖ Electrochemistry



	❖ Hydrocarbon Compounds ❖ Functional Groups of Organic Compounds ❖ Biomolecular Basics																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% Lecturer assessment: ❖ Project-Based Learning: 21% ❖ Collaborative Learning: 12% ❖ Midterm exam: 15% ❖ Case study: 12% ❖ Final exam: 15% ❖ Practicum: 25% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	Handbook Basic Chemistry, Tim Dosen, Chemistry UPT MKU Universitas Hasanuddin, 2024																														
Date of last amendment	8 August 2025																														



Module Description Basic Biology

Module designation	Basic Biology
Module code	23H04110103
Semester(s) in which the module is taught	1 st semester
Person responsible for the module (lecturers)	❖ Dr. Nur Haedar, S.Si. , M.Si. ❖ Muhammad Iqram, S.Si. , M.Sc.
Language	Indonesian language
Relation to curriculum	Compulsory
Teaching methods	Lecture, laboratory practice
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study ❖ 45 hours of laboratory practice
Credit points	3 credit points = 4.86 ECTS
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	ILO 2. Demonstrates a comprehensive understanding of theoretical concepts and technological literacy related to food science and technology principles and food law to support professional expertise in food science and technology (K)
	CLO 1. Explanation of basic concepts in organisms and the interaction of organisms with the environment CLO 2. Implementation of the concepts of metabolism, reproduction, organism coordination, and the application of biotechnology in the development of science in their respective fields
Content	Concept of biology: basic unit of life, virus, cell, metabolism (catabolism and anabolism), cell division and inheritance, plant reproduction system, animal reproduction system, coordination system (plant and animal), homeostasis, ecology, evolution, classification of living beings, basic biotechnology
Examination form	Writing (essay)



Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignment: 10% ❖ Presentation: 50% ❖ Laboratory work: 20% ❖ Examination: 20% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Barrett, J.M. 1986. BIOLOGY. Prentice-Hall, Englewood Cliffs, New Jersey 2. Campbell, N.A., Reece, J.B., Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky, P.V., Jackson, R.B. 2010., Biology. Edisi kedelapan Jilid 1. Erlangga, Jakarta. 3. Campbell, N.A., Reece, J.B., Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky, P.V., Jackson, R.B. 2010., Biology. Edisi kedelapan Jilid 2. Erlangga, Jakarta. 4. R.B. 2010., Biology. Edisi kedelapan Jilid 2. Erlangga, Jakarta. 5. Campbell, N.A., Reece, J.B., Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky, P.V., Jackson R.B. 2010., Biology. Edisi kedelapan Jilid 3. Erlangga, Jakarta. 6. 6. R.B. 2010., Biology. Edisi kedelapan Jilid 3. Erlangga, Jakarta.																														
Date of last amendment	4 August 2025																														



Module Description Basic Physic

Module designation	Basic Physic
Module code	23H02110703
Semester(s) in which the module is taught	1 st semester
Person responsible for the module (lecturers)	Syamsuddin, S.Si. , M.T.
Language	Indonesian language
Relation to curriculum	Compulsory
Teaching methods	Lecture, laboratory practice
Workload	Total workload (estimated): ☐ 27 hours of lecture ☐ 32 hours of exercise ☐ 32 hours of independent study ☐ 45 hours of laboratory practice
Credit points	3 credit points = 4.86 ECTS
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	ILO 2. Demonstrates a comprehensive understanding of theoretical concepts and technological literacy related to food science and technology principles and food law to support professional expertise in food science and technology (K)
	CLO 1. Identification of the properties or behavior of particles/objects in physical laws and equations related to the concepts of motion, heat, electricity, magnetism, optics, and light. CLO 2. Accurate application of mathematical equations in accordance with the learning substance to obtain solutions to physics problems. CLO 3. Accurate writing of quantity symbols and appropriate units in equations in each problem set.
Content	This module delivers material about kinematics and dynamics of objects, work and energy, fluid, elasticity, heat and temperature, Coulomb law and electric field, electrical current and circuits, waves and vibrations, optics and its tools, and modern physics.



Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% Lecturer assessment: assignment 10%, presentation 50%, laboratory work 20%, examination 20% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	Handbook of Basic of Physics. TIM Dosen Universitas Hasanuddin 2017																														
Date of last amendment	6 August 2025																														



Module Description Introduction to Agricultural Technology

Module designation	Introduction to Agricultural Technology
Module code	23G04110202
Semester(s) in which the module is taught	1 st semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Salengke, M.Sc. ❖ Ir. Daniel Useng, M.Eng.Sc., Ph.D ❖ Prof. Dr. Ir. Amran Laga, MS
Language	Indonesian language
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload	Total workload (estimated): ☐ 27 hours of lecture ☐ 32 hours of exercise ☐ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	ILO 2. Demonstrates a comprehensive understanding of theoretical concepts and technological literacy related to food science and technology principles and food law to support professional expertise in food science and technology (K)
	CLO 1. Scope of Agricultural Technology CLO 2. Scope of study of Agricultural Engineering and Food Science, and Technology
Content	This course aims to introduce and provide students with an understanding of fields and topics in agricultural technology
Examination form	Writing (essay)
Study and examination requirements	Examination requirements: Attendance above 80% Lecturer assessment: ☐ Individual tasks: 22.5% ☐ Quiz: 7.5% ☐ Midterm exam: 20% ☐ Case study: 50%



	Grading:		
	Numerical range	Letter grade	Conversion value
	85 - 100	A	4.00
	80 - < 85	A-	3.75
	75 - < 80	B+	3.50
	70 - < 75	B	3.00
	65 - < 70	B-	2.75
	60 - < 65	C+	2.50
	50 - < 60	C	2.00
	40 - < 50	D	1.00
	< 40	E	0.00
<i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>			
Reading list	Materials for lectures are taken from various sources		
Date of last amendment	5 August 2025		



Module Description Education of Pancasila

Module designation	Education of Pancasila
Module code	23U01110702
Semester(s) in which the module is taught	2 nd semester
Person responsible for the module (lecturers)	❖ Rahmatullah, SIP., M.Si. ❖ Dr. Safriadi, SIP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload	Total workload (estimated): ☐ 27 hours of lecture ☐ 32 hours of exercise ☐ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	ILO 1. Demonstrates the ability to act as a responsible citizen who respects diversity based on the national ideology of Indonesia (A)
	CLO 1. Students can internalize the values of diversity as independent individuals with character. CLO 2. Students can analyze the values of diversity to achieve independent individuals with character.
Content	☐ Pancasila education in college ☐ Pancasila in the history of the Indonesian nation ☐ Pancasila as a system philosophy ☐ Pancasila as the foundation country ☐ Pancasila as state ideology ☐ Pancasila as a development paradigm ☐ Pancasila as a system of ethics
Examination form	Writing (essay)
Study and examination requirements	Examination requirements: Attendance above 80% Lecturer assessment: ☐ Collaborative learning: 20% ☐ Case study: 44%



	☐ Project-based learning: 26% ☐ Final exam: 10% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Directorate General of Higher Education, 2016. Teaching Materials for Pancasila Education Courses. Jakarta: Directorate of Learning and Student Affairs 2. Notonagoro. 1994. Pancasila Scientifically Popular. Jakarta: Bumi Literacy. 3. Kaelan. 2000. Pancasila Education. Yogyakarta: Paradigm. 4. Yudi Latif. 2017. Plenary Country. Jakarta: Scholastic 5. Anwar Arifin. 2018. Pancasila Central Ideology without Opposition. Jakarta: Nufa Citra Mandir																														
Date of last amendment	6 August 2025																														



Module Description Citizenship Education

Module designation	Citizenship Education
Module code	23U01110802
Semester(s) in which the module is taught	2 nd semester
Person responsible for the module (lecturers)	❖ Rahmatullah, SIP., M.Si. ❖ Dr. Safriadi, SIP., M.Si. ❖ Ashar Prawitno, S.IP. , M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	The Insight of Maritime Social and Culture
Module objectives/ Intended Learning Outcomes (ILO)	ILO 1. Demonstrates the ability to act as a responsible citizen who respects diversity based on the national ideology of Indonesia (A)
	CLO 1. Students are able to internalize national values as independent individuals with character. CLO 2. Students are able to analyze national values to achieve independent, character-based individuals. CLO 3. Students are able to demonstrate citizenship skills critically, systematically, innovatively, with integrity, and are able to communicate effectively, and are able to work independently or in teams using humanistic science and technology.
Content	❖ Citizenship Education in College ❖ Identity & National Integration ❖ System Constitution ❖ Citizen Rights and Obligations Country ❖ The State of Law and Corruption ❖ Geopolitics and Geostrategy of Indonesia ❖ Democracy and Human Rights



Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% Lecturer assessment: ❖ Collaborative learning: 10% ❖ Case study: 55% ❖ Project-based learning: 25% ❖ Final exam: 10% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Nurwardani, et al, (2016). Citizenship Education for Higher Education. Jakarta: Directorate General of Learning and Student Affairs Ministry of Research, Technology and Higher Education of the Republic of Indonesia 2. Pend Lecturer Team. Citizenship, (2014), Citizenship Education Learning Module, UPT MKU Unhas. 3. Sammy ferrijayan, et al, (2014), National Insight Module and Basic Values of National Defense, Indonesian State Administrative Institute.																														
Date of last amendment	6 August 2025																														



Module Description Religion (Islam)

Module designation	Religion (islam)
Module code	23U01110102
Semester(s) in which the module is taught	2 nd semester
Person responsible for the module (lecturers)	❖ Fitriani, S.S., M.Hum. ❖ Ust. Prof. Dr. Ir. H. Musbir Tahir, M.Sc. ❖ Haeriyah, S.Ag., M.Pd.I. ❖ Dr. H. Ahmad Mujahid, M.Ag
Language	Indonesian language
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.41 ECTS
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	ILO 1. Demonstrates the ability to act as a responsible citizen who respects diversity based on the national ideology of Indonesia (A)
	CLO 1. Able to internalize Islamic values contained in the basic framework of Islamic teachings. CLO 2. Able to analyze religious values and diversity to achieve independent individuals with character and a spirit of social sensitivity. CLO 3. Able to integrate Islamic values with science and technology based on scientific disciplines, both independently and in teams.
Content	❖ Internalization of Islamic religious values ❖ Proof of the existence of Allah and monotheism ❖ Actualization of moral values in life ❖ Law and human rights in Islam ❖ The concept of civil society and community welfare ❖ Religious, cultural, and political diversity in religious, national, and state life



	❖ Integration of science and technology in accordance with Islamic teachings																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% Lecturer assessment: ❖ Individual assignment: 25% ❖ Project-based learning: 10% ❖ Case study: 65% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Pendidikan Agama Islam. 2014. Tim Pengajar Universitas Hasanuddin. UPT MKU Universitas Hasanuddin 2. Direktorat Jenderal Pendidikan Tinggi. 2016. Pendidikan Agama Islam untuk Perguruan Tinggi. Dirjen Pembelajaran dan Kemahasiswaan Kemenristek Dikti 3. Mukti Ali. 2020. <i>Metode Memahami Agama Islam</i>. Jakarta: Bulan Bintang. 4. M. Amin Abdullah. 2006. <i>Islamic studies di Perguruan Tinggi: Pendekatan Integratif-Interkonektif</i>. Yogyakarta: Pustaka Pelajar. 5. Maman. 2012. <i>Pola Berpikir Sains: Membangkitkan Kembali Tradisi Keilmuan Islam</i>. Bogor: QMM Publishing. 6. Ismail R. Al-Faruqi & Lois Lamya Al-Faruqi. 1986. <i>The Cultural Atlas of Islam</i>. New York: Macmillan Publishing Company.																														



	7. Seyyed Hossein Nasr. 1994. <i>Menjelajah Dunia Modern: Bimbingan untuk Generasi Muda Muslim</i>. Bandung: Mizan. 8. Saifudin Aman. 2013. <i>Tren Spiritualitas Milenium Ketiga</i>. Jakarta: Ruhama. 9. Nurcholish Madjid. 2008. <i>Islam: Kemodernan dan keindonesiaan</i>. Bandung: Mizan. 10. Hakim, L. (2012). Islam, Pluralitas Agama, dan Pembentukan Masyarakat Madani di Indonesia. <i>Harmoni</i>, 11(1), 26-33. 11. Budhy Munawar-Rachman; Sukidi. (2001). <i>Islam pluralisme: wacana kesetaraan kaum beriman</i>. Jakarta: Paramadina. 12. Hisham Thalbah Syarif Hade Masyah. (2008.). <i>Ensiklopedia mukjizat Al-qur'an dan Hadits</i>. Jakarta: Sapta Sentosa. 13. Agus Pramono. 2021. <i>Perkembangan Ilmu Pengetahuan & Teknologi Dalam Perspektif Islam</i>. Sleman: Deepublish.
Date of last amendment	6 August 2025



Module Description Calculus

Module designation	Calculus
Module code	23G03110102
Semester(s) in which the module is taught	2 nd semester
Person responsible for the module (lecturers)	Sri Astuti Thamrin, S.Si., M.Stat., Ph. D
Language	Indonesian language
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Basic Mathematics
Module objectives/ Intended Learning Outcomes (ILO)	ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management (C2)
	CLO 1. Explanation of calculus concepts, including: Introduction to Logic, Permutations and combinations, Transcendent Functions, Derivatives. CLO 2. Use of Derivatives, Integrals, and Use of Integrals, Linear and Nonlinear Equations, Systems of Linear Equations, Optimization
Content	❖ Polynomial Function ❖ Exponential function ❖ Trigonometric Function ❖ linear equation, linear inequality, drawing curves, linear optimization ❖ limit ❖ derivatives ❖ integral
Examination form	Writing (essay)



Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual tasks: 22.5% ❖ Quiz: 7.5% ❖ Midterm exam: 20% ❖ Case study: 50% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
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60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Stroud, K., A. 2001. Engineering Mathematics 5th Edition. Industrial Press, Inc., New York 2. Purcell., Varberg., Rigdon. 1997. Calculus. 3. Blank, B., E., Krantz, S., G. 2011. Calculus Single Variable. John Wiley & amp; Sons 4. Kuttler, K. 2011. Calculus, Applications and Theory Volume 1. World Scientific Publishing																														
Date of last amendment	10 August 2025																														



Module Description Analytical Chemistry

Module designation	Analytical Chemistry
Module code	23G03110202
Semester(s) in which the module is taught	2 nd semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Meta Mahendradatta ❖ Dr. rer.nat. Ir. Zainal, STP., M.Food.Tech. ❖ Dr. Februadi Bastian, STP., M.Si. ❖ Sunrixon Carmando Yuansah, S.TP., M.T.P.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Basic Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management (C2)
	CLO 1. Able to factually understand classical chemical analysis methods (gravimetry, volumetry, potentiometry, cation-anion, extraction) CLO 2. Able to understand factually related to chemical analysis methods (Spectrophotometry (UV-VIS, HPLC, GC-MS, AAS, FTIR)
Content	❖ Analytical error theory ❖ Sampling technique ❖ Classical analytical chemistry: Cation identification and Anion identification ❖ Classical analytical chemistry (conventional method): gravimetry, titrimetry (acid-base, redox, deposition, complexometry), electrochemical methods (conductometry and potentiometry), extraction systems



	❖ Analytical chemistry instrumentation: Basics of spectrophotometry, HPLC, GC, AAS, and FTIR																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 17% ❖ Case study: 33% ❖ Midterm exam: 25% ❖ End of semester test: 25% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Belitz, H.-D. W. Grosch und P. Schieberle, 2001. Lehrbuch der Lebensmittelchemie, Springer-Verlag, Berlin, Heidelberg, New York. 2. Potter, N.N. and J.H. Hotchkiss, 1998. Food Science, 5th Ed. Springer Science+Business Media, Inc., New York. 3. Schwedt, Georg., 2005. Taschenatlas der Lebensmittelchemie. Wiley-Vch Verlag, Weinheim. 4. Walstra, P. Physical Chemistry of Foods. 2003. Marcell Dekker, Inc. New York 5. Kusnandar, F. 2010. Food Analysis. IPB Press.																														
Date of last amendment	23 August 2025																														



Module Description Organic Chemistry

Module designation	Organic chemistry
Module code	23G03110302
Semester(s) in which the module is taught	2 nd semester
Person responsible for the module (lecturers)	❖ Dr. rer.nat. Ir. Zainal, STP., M.Food.Tech. ❖ Dr. Februadi Bastian, STP., M.Si., ❖ Dr. Muhammad Asfar, STP., MSi, ❖ Sunrixon Carmando Yuansah, STP., MTP.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Basic Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management (C2)
	CLO 1. Able to understand facts related to hydrocarbons and functional groups in macronutrients CLO 2. Able to understand factually the types of bonds, chemical reactions in food ingredients, chemical structure, and stereochemistry
Content	❖ Molecular Orbitals and Chemical Bonding ❖ Delineation of Organic Chemical Structures ❖ Stereochemistry ❖ Saturated Hydrocarbons ❖ Unsaturated Hydrocarbons ❖ Aromatic and Cyclic Hydrocarbons ❖ Functional Groups ❖ Chemistry Organic in Food Ingredients
Examination form	Writing (essay)



Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 50.5% ❖ Quiz: 27.5% ❖ Midterm exam: 22% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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Reading list	1. Fessenden R. J and Fessende J. S., Organic Chemistry. Third edition. Editor: Aloysius H. Erlangga Publisher, 1982 2. Paula Y.B., Organic Chemistry. Pearson Education. 2017 3. Jonathan C., Nick G., and Stuart W., Organic Chemistry. Oxford University Press. 2012 4. Hans D.B., Werner G., and Peter S., Food Chemistry. Springer. 2009																														
Date of last amendment	23 August 2025																														



Module Description General Microbiology

Module designation	General Microbiology
Module code	23G03110402
Semester(s) in which the module is taught	2 nd semester
Person responsible for the module (lecturers)	❖ Dr.Ir Andi Hasizah, M.Si ❖ Arfina Sukmawati Arifin, S.TP., M.Si ❖ Dr. Fitri, S.TP.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Basic Biology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 2. Demonstrates a comprehensive understanding of theoretical concepts and technological literacy related to food science and technology principles and food law to support professional expertise in food science and technology (K)
	CLO 1. Able to explain conceptually the role and factors of microorganism growth CLO 2. Able to explain conceptually prokaryotic and eukaryotic organisms
Content	❖ Definition and history of microbiology development ❖ Morphological characteristics, structure, and cell composition of prokaryotic organisms and eukaryotic organisms ❖ Metabolism of microorganisms ❖ Nutrition microbes, patterns of growth in microorganisms, growth factors, and control thunte ❖ Morphological characteristics and classification of protozoa, microalgae, and viruses ❖ Identification, characteristics, and calculation of microbes



	❖ The role of microorganisms in various fields (food industry)																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 60% ❖ Quiz: 40% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Alexander Steinbuechel, 2010. Microbiology Monographs, Volume 18. Springer Verlag, Berlin, Heidelberg 2. Paul, E.A.,2007. Soil Microbiology, Ecology and Biochemistry 3rd Edition. United States of America : ELSIVIER 3. Schaechter, M (2004). The Desk Encyclopedia of Microbiology. California U.S.A: Elsevier Academic Press 4. Stuart Hogg, 2005. Procaryote Diversity, in Essential Microbiology, p 164-169. John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex PO19 8SQ, England 5. Tortora, G.J., Berdell R. F. and Christine L.C, 2010. Microbiology. An Introduction. Tenth Edition, Benyamin Cumming, san Franscisco 6. P. Narayanasamy, 2011. Microbial Plant Pathogens-Detection and Disease Diagnosis. Springer Science+Business Media B.V.																														



	7. Ronald M. Atlas, 2010. Handbook of Microbiological Media Fourth Edition. CRC Press, Taylor & Francis Group, Boca Raton, FL 33487-2742 8. Webster, J. and R.W.S. Weber. 2007. Introduction to Fungi. Cambridge University Press. Cambridge 9. William B. Whitman, 2010. Bergey's Manual of Systematic Bacteriology. Springer Verlag, New York Dordrecht Heidelberg London 10. Barron, G.L . 1977 . The Nematode-Destroying Fungi. Topics in Mycobiol. No.1 11. Jawaaid A. Khan, Jeanne Dijkstra, 2002. Plant Viruses As Molecular Pathogens. The Haworth Press, Inc.
Date of last amendment	25 August 2025



Module Description Food Industry Management

Module designation	Food Industrial Management
Module code	23G03110502
Semester(s) in which the module is taught	2 nd semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Mulyati Muhammad Tahir, MS. ❖ Prof. Ir. Andi Dirpan, STP., M.Si., Ph.D. ❖ Muhpidah, S.TP., M.Si ❖ A. Hermina Julyaningsih, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Introduction to Agricultural Technology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 2. Demonstrates a comprehensive understanding of theoretical concepts and technological literacy related to food science and technology principles and food law to support professional expertise in food science and technology (K)
	ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management (C2)
	CLO 1. Students can understand, analyze, and explain the concepts of food industrialization, managerial, operational, and strategies for developing the food industry CLO 2. Students can design, evaluate, and manage the establishment and operation of the food industry by utilizing technology, information systems, management methods, and industrial feasibility analysis



Content	Food industrialization in general (including industrial design that includes procedural, concepts, opportunities, challenges, problems, and influential factors in the food industry), explains the characteristics of food, industrial policies and strategies, managerial food industry, food industry operations, information collection, industry establishment, computer use, and design evaluation techniques.																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ☐ Problem-based learning: 50% ☐ Case study: 40% ☐ Individual assignments: 10% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Dorfman, Jeffrey. 2014. & Nbsp; Economics and Management of the Food Industry. Routledge 2. Cousins, John. et.al. 2019. Food and Beverage Management: For the Hospitality, Tourism and Event Industries. & Nbsp; Goodfellow Pub Ltd 3. Jordan, Lisa. 2015. Food Industry: Food Processing and Management. Callisto Reference.																														
Date of last amendment	9 July 2025																														



Module Description

Application of Analytic Chemistry and Organic Chemistry

Module designation	Application of Analytic Chemistry and Organic Chemistry
Module code	23G03110602
Semester(s) in which the module is taught	2 nd semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Meta Mahendradatta ❖ Dr. rer.nat. Ir. Zainal, STP., M.Food.Tech.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Laboratory practice
Workload	Total workload (estimated): 91 hours of practicum
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Basic Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards (S) ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management (C2)
	CLO 1. Students can practically practice analytical chemistry concepts CLO 2. Students can practically practice organic chemistry concepts CLO 3. Students can organize and collaborate with teams in practicing analytical chemistry and organic chemistry concepts
Content	❖ Analytical chemistry classic method ❖ Analytical chemistry instrumentation method ❖ Organic chemistry
Examination form	Writing (essay)
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Final Report of Practicum: 70% ❖ Midterm exam: 15%



	❖ End of semester exam: 15% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Belitz, H.-D. W. Grosch und P. Schieberle, 2001. Lehrbuch der Lebensmittelchemie, Springer-Verlag, Berlin, Heidelberg, New York. 2. Potter, N.N. and J.H.Hotchkiss, 1998. Food Science, 5th Ed. Springer Science+Business Media, Inc., New York. 3. Schwedt, Georg., 2005. Taschenatlas der Lebensmittelchemie. Wiley-Vch Verlag, Weinheim. 4. Walstra, P. Physical Chemistry of Foods. 2003. Marcell Dekker, Inc. New York 5. Kusnandar, F. 2010. Food Analysis. IPB Press. 6. Fessenden R. J and Fessende J. S., Organic Chemistry. Third edition. Editor: Aloysius H. Erlangga Publisher, 1982 7. Paula Y.B., Organic Chemistry. Pearson Education. 2017 8. Jonathan C., Nick G., and Stuart W., Organic Chemistry. Oxford University Press. 2012 9. Hans D.B., Werner G., and Peter S., Food Chemistry. Springer. 2009																														
Date of last amendment	2 July 2025																														



Module Description Application of Laboratory Technique

Module designation	Application of Laboratory Technique
Module code	23G03110702
Semester(s) in which the module is taught	2 nd semester
Person responsible for the module (lecturers)	❖ Dr. Adiansyah, STP., M.Si. ❖ Prof. Dr. Andi Nurfaidah Rahman, STP., M.Si. ❖ Dr. Muhammad Asfar, STP., M.Si. ❖ Muhpidah, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Laboratory practice
Workload	Total workload (estimated): 91 hours of practicum
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards (S) ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management (C2) CLO 1. Students can practice Good Laboratory Practice (GLP) in practical work in the Laboratory CLO 2. Students can master the concepts and theory of dilution CLO 3. Students can explain the scope of use of equipment in the laboratory CLO 4. Students can master the principles of using the spectrophotometer equipment CLO 5. Students can organize and collaborate with teams in laboratory engineering application activities.
Content	❖ Good Laboratory Practice (GLP) ❖ Introduction to tools



	❖ The principle of dilution, making solutions and determining the concentration of solutions ❖ Analysis of moisture content, AW, protein, fat and carbohydrates																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Final Report of Practicum: 70% ❖ Midterm exam: 15% ❖ End of semester exam: 15% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
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80 - < 85	A-	3.75																													
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50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Richard Owusu-Apenten, 2004. Introduction to Food Chemistry. CRC Press, ISBN 9781420058178 2. Yoni, Atma (2018) Prinsip Analisis Komponen Pangan: Makro & Mikro Nutrien. CV Budi Utama. 3. Dwi Setyaningsih, Anton Apriyantono, Maya Puspita Sari. 2010. Analisis Sensori untuk Industri Pangan dan Argo. Bogor: IPB Press 4. A Guide to Laboratory Engineering Applications. 2025. UNHAS ITP Lecturer Team																														
Date of last amendment	2 July 2025																														



Module Description Evaluation of Food Nutrition

Module designation	Evaluation of Food Nutrition
Module code	23G03120102
Semester(s) in which the module is taught	3 rd semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Meta Mahendradatta ❖ Prof. Dr. Ir. Jalil Genisa, M.S. ❖ Dr. Adiansyah, STP., M.Si ❖ Dr. Andi Nurfaidah Rahman, STP., M.Si
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	ILO 8. Conducts chemical and physical analysis of food to support quality management and control, including food products for special dietary purposes (C5) CLO 1. Able to explain concepts related to metabolism and human nutritional needs. CLO 2. Able to conceptually explain the influence of food processing and evaluate nutritional value
Content	❖ Introduction of food nutrition evaluation ❖ Nutrition and Human Health ❖ Digestion, absorption, and transportation of food in the body ❖ Food processing and its influence on nutritional value ❖ Evaluation of macronutrients nutritional value
Examination form	Writing (essay)
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Case study: 12.5%



	❖ Project: 62.5% ❖ Exam: 25% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> If student(s) receives(s) a score below 40, student(s) must retake the course	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Robert S. Harris and Endel Karmas. 1989. Evaluation of Nutrition in Food Processing. ITB Publisher, Bandung. 2. Elly Ishak. 2011. Food Science and Technology. Unhas Identity Publisher. Makassar 3. Meta Mahendradatta. 2007. Safe and Healthy Food. Unhas Publishing Institution. Makassar 4. Made Astawan and Deddy Muchtadi. 2014. Evaluation of Food Nutrition Value. Open University, South Tangerang																														
Date of last amendment	9 July 2025																														



Module Description Food Chemistry

Module designation	Food Chemistry
Module code	23G03120202
Semester(s) in which the module is taught	3 rd semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Abu Bakar ❖ Prof. Dr. Ir. Meta Mahendradatta ❖ Prof. Dr. Andi Nurfaidah Rahman, STP., M.Si ❖ Dr. Fitri, S.TP
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Analytic Chemistry and Organic Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 8. Conducts chemical and physical analysis of food to support quality management and control, including food products for special dietary purposes (C5) CLO 1. Able to apply facts related to water, macro, and micro components in food ingredients CLO 2. Able to apply facts related to the interaction of macro and micro nutrient components in animal and plant tissues; and during food processing
Content	❖ Introduction ❖ Water ❖ Macro and micro components in food ❖ Interactions between macro-macro components in food and during processing
Examination form	Writing (essay)
Study and examination requirements	Examination requirements: Attendance above 80%



	❖ Individual tasks: 65% ❖ Midterm exam: 15% ❖ End of semester test: 20% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Belitz, H.-D. W. Grosch und P. Schieberle, 2001. Lehrbuch der Lebensmittelchemie, Springer-Verlag, Berlin, Heidelberg, New York. 2. Potter, N.N. and J.H.Hotchkiss, 1998. Food Science, 5th Ed. Springer Science+Business Media, Inc., New York. 3. Schwedt, Georg., 2005. Taschenatlas der Lebensmittelchemie. Wiley-Vch Verlag, Weinheim. 4. Walstra, P. Physical Chemistry of Foods. 2003. Marcell Dekker, Inc. New York 5. Kusnandar, F. 2010. Food Analysis. IPB Press.																														
Date of last amendment	11 July 2025																														



Module Description Research Methodology

Module designation	Research Methodology
Module code	23G03120302
Semester(s) in which the module is taught	3 rd semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Abu Bakar ❖ Prof. Ir. Andi Dirpan, STP., M.Si., Ph.D. ❖ Dr. Februadi Bastian, STP., M.Si ❖ A. Hermina Julyaningsih, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Indonesia Language
Module objectives/ Intended Learning Outcomes (ILO)	ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards (S) ILO 4. Demonstrates the ability to make strategic decisions in food science and technology based on scientific data analysis and big data interpretation (C1) CLO 1. Students are able to understand the principles of research ethics and compile scientific papers and research proposals according to correct academic rules. CLO 2. Students are able to design, implement, analyze, and present research results in the form of scientific work that meets academic standards and scientific publication ethics
Content	❖ Ethics in research ❖ Use of ai and its ethics in writing scientific papers ❖ Sections of scientific papers ❖ Preparation of scientific papers



	❖ Use of applications for compiling scientific papers																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Project: 70% ❖ Quiz: 5% ❖ Case study: 25% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Chaterine Dawson, (2007), A Practical Guide to Research Methods, 2nd Edition. How to books ltd.oxford, uk2.c.R. 2. Kothari, (2004), Research Methodology Methods and Technique, 2nd Edition.New Age International Publisher.daryagan, New Delhi																														
Date of last amendment	14 July 2025																														



Module Description Microbiology and Food Safety

Module designation	Microbiology and Food Safety
Module code	23G03120402
Semester(s) in which the module is taught	3 rd semester
Person responsible for the module (lecturers)	❖ Dr. Ir Andi Hasizah, M.Si ❖ Arfina Sukmawati Arifin, S.TP., M.Si ❖ Dr. Fitri, S.TP
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	General Microbiology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 6. Identifies microorganisms in food ingredients and processed foods, including applications in biotechnology (C3)
	CLO 1. Able to explain conceptually the growth of microbes in food ingredients and products, and the mechanisms of microbial resistance in food processing CLO 2. Able to explain conceptually the types and actions of pathogenic microbes in food
Content	❖ Introduction to the scope of microbiology and food safety ❖ Types and characteristics of spoilage and pathogenic microbes ❖ Factors that influence microbial growth (intrinsic and extrinsic) ❖ Indicator microbes in processed food products ❖ Pathogenic microbes are dominant in several types food ❖ Toxin-producing microbes found in several types of food ❖ Dominant destructive microbes found in several types of food



	❖ Control of microbes using various techniques: heat, low A_w, acid, lipophilic acid, low temperature, irradiation and so on ❖ Sublethal damage to microbes and spores during processing ❖ Micotoxin ❖ Methods for detecting and quantifying pathogenic microbes and the toxins produced ❖ Diseases caused by microbes in food																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 50% ❖ Case study: 50% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Food Microbiology (Theory and Practice) by Tatang Sopandi and Wardah 2. The Microbiology of Safe Food by Stephen J. Forsythe 3. Microbial Food Safety by Omar A. Oyarzabal and Steffen Bapert 4. Microbial Food Safety and Preservation V.ravishankar Rai and Jamuna a.bai																														
Date of last amendment	10 July 2025																														



Module Description

Food Quality Supervision and Control

Module designation	Food Quality Supervision and Control
Module code	23G03120502
Semester(s) in which the module is taught	3 rd semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Meta Mahendradatta ❖ Dr. rer.nat. Ir. Zainal, STP., M.Food.Tech. ❖ Dr. Muhammad Asfar, STP., MSi ❖ Muhipdah, S.TP., M.Si
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	General Microbiology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 2. Demonstrates a comprehensive understanding of theoretical concepts and technological literacy related to food science and technology principles and food law to support professional expertise in food science and technology (K) ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management (C2) ILO 8. Conducts chemical and physical analysis of food to support quality management and control, including food products for special dietary purposes (C5) CLO 1. Students are able to conceptually understand the principles and guarantees of food quality control CLO 2. Students are able to conceptually understand the food quality assurance system and its application
Content	☐ Quality Food ☐ Food Safety Hazards



	☐ Food Quality Assurance System ☐ Transgenic Food ☐ Recording and reporting (control chart)																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ☐ Individual tasks: 20% ☐ Group task: 20% ☐ Case study: 40% ☐ Presentation: 20% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Kramer, A. and B.A. Twigg, 1970. Quality Control for the Food Industry. The Avi Publishing Company, Inc., Westport Connecticut. 2. Rampenggan, V., J. Pontoh, and D.T. Sembel, 1985. Fundamentals of Food Quality Supervision, BKS-PTN, Eastern Indonesia. 3. Soekarto, S.T., 1990. Fundamentals of Food Quality Supervision and Standardization, PAU Food and Nutrition IPB, Bogor. 4. Halal Food Processing 5. Control Chart 6. FAO, 1998. Food Quality and Safety Systems. 7. FAO, 1995. Quality Management and Quality Systems Elements, Part 1: Guidelines.																														
Date of last amendment	9 July 2025																														



Module Description Colloid Physical Chemistry

Module designation	Colloid Physical Chemistry
Module code	23G03120602
Semester(s) in which the module is taught	3 rd semester
Person responsible for the module (lecturers)	❖ Dr. Adiansyah, STP., M.Si. ❖ Dr. rer.nat. Ir. Zainal, STP., M.Food.Tech. ❖ Muhpidah, S.TP., M.Si
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Basic Chemistry and Basic Physic
Module objectives/ Intended Learning Outcomes (ILO)	ILO 8. Conducts chemical and physical analysis of food to support quality management and control, including food products for special dietary purposes (C5)
	CLO 1. Students are able to conceptually apply the properties of gases and solutions, and the laws of thermodynamics to food CLO 2. Students are able to conceptually apply emulsions and colloids
Content	❖ Understanding physical chemistry ❖ Reaction Kinetics ❖ Solutions ❖ Colloids ❖ Suspensions ❖ Gases ❖ Soft Solids ❖ Electrolyte Solutions ❖ Electron Transport ❖ Thermodynamics
Examination form	Writing (essay)



Study and examination requirements	Examination requirements: Attendance above 80% ❖ Quiz: 3% ❖ Individual assignments: 42% ❖ End of semester test: 55% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Atkins, P and de Paula, J. 2006. Physical Chemistry. W.H. Freeman and Company 2. Pieter Walstra. 2003. Physical Chemsitry of Foods. Marcel Dekker, Inc. New York.Basel. 3. Tony Bird. 1993. Physical Chemistry for Universities. PT Gramedia Pustaka Utama Jakarta 4. Anonymous, 2008. Training Module. Estimation and Control of Food Products Shelf Life. Department of Food Science and Technology Fateta-IPB collaborates with the Southeast Asian Food and Agricultural Science and Technology Center-IPB (Seafast-IPB).																														
Date of last amendment	9 July 2025																														



Module Description

Food Analysis

Module designation	Food Analysis
Module code	23G03120702
Semester(s) in which the module is taught	3 rd semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Abu Bakar ❖ Prof. Dr. Ir. Meta Mahendradatta ❖ Dr. rer.nat. Ir. Zainal, STP., M.Food.Tech. ❖ Dr. Muhammad Asfar, STP., MSi
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Analytical Chemistry and Organic Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 8. Conducts chemical and physical analysis of food to support quality management and control, including food products for special dietary purposes (C5)
	CLO 1. Able to explain conceptually the properties and reactions of various food components CLO 2. Able to explain conceptually the technical principles and methods of food analysis
Content	❖ Properties and reactions of water, carbohydrate, fat and protein components ❖ Properties and reactions of vitamin and mineral components ❖ Methods for analyzing nutritional components in foodstuffs ❖ Methods for analyzing non-nutritional components in foodstuffs
Examination form	Writing (essay)
Study and examination requirements	Examination requirements: Attendance above 80%



	❖ Individual tasks: 40% ❖ Midterm exam: 65% ❖ End of semester test: 20% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Andarwulan, N., Feri Kusnandar, Dian Herawati. 2011. Food Analysis. Dian Rakyat. Jakarta. 2. Linden, G. (1996) Analytical Technique for Food and Agricultural Products. Chapman & Hall, International Thomson Publishing Company, New York. 3. Leo, M.L.Noilet. (1998) 2-volume handbook of food analysis. Chapman & Hall, International Thomson Publishing Company, New York. 4. Matissek, R., F.M. Schnepel, G Steiner. Lebensmittel Analytic. Springer-Verlag, Berlin. 5. Pomeranz, Y. and C.E Meloan. (1994). Food Analysis, Theory and Practice. Chapman & Hall, International Thomson Publishing Company, New York. 6. Schwedt, G. (1992) Taschenatlas der Anaytik. Georg Thieme Verlag, Stuttgart.																														
Date of last amendment	9 July 2025																														



Module Description

Application of Physical and Chemical Changes in Food

Module designation	Application of Physical and Chemical Changes in Food
Module code	23G03120802
Semester(s) in which the module is taught	3 rd semester
Person responsible for the module (lecturers)	❖ Dr. Februadi Bastian, STP., M.Si. ❖ Dr. Muhammad Asfar, STP., MSi ❖ Arfina Sukmawati Arifin, S.TP., M.Si ❖ Sunrixon Carmando Yuansah, S.TP, M.TP.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Laboratory practice
Workload	Total workload (estimated): 91 hours of practicum
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Analytical Chemistry and Organic Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards (S) ILO 8. Conducts chemical and physical analysis of food to support quality management and control, including food products for special dietary purposes (C5) CLO 1. Students are able to determine damage and changes in food quality as well as the nutritional and non-nutritional content of food. CLO 2. Students are able to imitate the process of nutritional and non-nutritional analysis of food ingredients. CLO 3. Students are able to identify damage and changes in food quality from various causal factors. CLO 4. Students are able to build collaboration and teamwork
Content	❖ Changes in food quality ❖ Macro and micronutrient components and analysis ❖ Evaluation of quality changes in oils ❖ Effect of physical changes in the addition of hydrocolloids ❖ Physical and chemical changes in the gelatinization



	process ❖ Changes in functional properties protein ❖ Physical and chemical changes in the caramelization process and Maillard reaction																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Quiz: 15% ❖ Draft practicum report: 18% ❖ Preliminary task: 6% ❖ Practicum response: 6% ❖ Final report of practicum: 12% ❖ Activeness: 6% ❖ Logbook: 12% ❖ Individual tasks: 20% ❖ Presentation: 5% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
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70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Richard Owusu-Apentene, 2004. ITroduction to food chemical. CRC Press, ISBN 9781420058178 2. Yoni, Atma (2018) Principle of Food Component Analysis: Macro & amp; Micro nutrient. CV BUDI UTAMA. 3. Dwi Setyaningsih, Anton Apriyantono, Maya Puspita Sari. 2010. Sensory Analysis for the Food and Argo Industry. Bogor: IPB Press																														
Date of last amendment	9 July 2025																														



Module Description Food Biochemistry

Module designation	Food Biochemistry		
Module code	23G03120902		
Semester(s) in which the module is taught	3 rd semester		
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Amran, M.Si. ❖ Dr. rer.nat. Ir. Zainal, STP., M.Food.Tech. ❖ Dr. Fitri, S.TP		
Language	Indonesian language		
Relation to curriculum	Compulsory course		
Teaching methods	Lecture		
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study		
Credit points	2 credit points = 3.24 ECTS		
Required and recommended prerequisites for joining the module	Organic Chemistry and Analytical Chemistry		
Module objectives/ Intended Learning Outcomes (ILO)	ILO 8. Conducts chemical and physical analysis of food to support quality management and control, including food products for special dietary purposes (C5)		
	CLO 1. Students are able to explain the components that make up biomolecules CLO 2. Students are able to explain metabolic processes (Catabolism and Anabolism) CLO 3. Students are able to explain post-harvest biochemical changes in meat, fruit and vegetable products		
Content	❖ Biomolecular components ❖ Metabolic processes (anabolism and catabolism) ❖ Post-harvest biochemistry		
Examination form	Writing (essay)		
Study and examination requirements	Examination requirements: Attendance above 80%		
	☐ Individual assignments: 50% ☐ Exam: 50% Grading:		
		Numerical range	Letter grade
		Conversion value	



	85 - 100	A	4.00
	80 - < 85	A-	3.75
	75 - < 80	B+	3.50
	70 - < 75	B	3.00
	65 - < 70	B-	2.75
	60 - < 65	C+	2.50
	50 - < 60	C	2.00
	40 - < 50	D	1.00
	< 40	E	0.00
<i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>			
Reading list	1. Aung Sumbono. (2016). Basic food biochemistry / Aung Sumbono. Yogyakarta: Deepublish,.		
Date of last amendment	10 July 2025		



Module Description

Statistics and Experimental Design

Module designation	Statistics and Experimental Design
Module code	23G03121002
Semester(s) in which the module is taught	3 rd semester
Person responsible for the module (lecturers)	❖ Prof. Ir. Andi Dirpan, STP., M.Si., Ph.D. ❖ Prof. Dr. Ir. Mursalim, IPU., ASEAN.Eng. ❖ Prof. Sri Astuti Thamrin, S.Si., M.Stat., Ph.D
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Calculus
Module objectives/ Intended Learning Outcomes (ILO)	ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management (C2)
	- CLO 1. Know the basic concepts of statistics - CLO 2. Distinguish between descriptive statistics and inferential statistics - CLO 3. Choose various ways of testing statistical data - CLO 4. Complete statistical data calculations both manually and using computer programs - CLO 5. Understand the difference between regression and correlation - CLO 6. Understand the meaning of experimental design, the purpose of an experimental design, the basic principles of experimental design, and the classification of experimental designs. - CLO 7. Understand the application of completely randomized design and randomized block design in the field of food technology



Content	❖ Preparation and presentation of data ❖ Descriptive statistics ❖ Hypothesis testing ❖ Correlation and regression ❖ Variety analysis, completely randomized design, randomized block design, advanced test																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual tasks: 50% ❖ Case study: 50% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Asep Saifuddin, Khairil Anwar Notodipuro, Aam Alamudi and Kusman Sadik. 2009. Basic Statistics. PT. Grasindo, Jakarta. 2. Johnson, Robert and Patricia Kuby. 2008. Elementary Statistics 10th Ed. Thomson Brooks/Cole, Belmont, Ca. 3. Walpole, R. E. and Raymond H. Myers. 2007. Probability and Statistics for Engineers and Scientists 8th Ed. Pearson Prentice Hall. London. (Translation: Introduction to Statistics 3rd Edition 1993. PT. Gramedia Pustaka Utama, Jakarta.)																														
Date of last amendment	24 July 2025																														



Module Description

Sanitation and Management of Industrial Waste

Module designation	Sanitation and Management of Industrial Waste
Module code	23G03121102
Semester(s) in which the module is taught	3 rd semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Amran, M.Si. ❖ Arfina Sukmawati Arifin, S.TP., M.Si ❖ Muhpidah, S.TP., M.Si
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Industrial Management
Module objectives/ Intended Learning Outcomes (ILO)	ILO 7. Demonstrates the ability to manage food waste effectively while ensuring food safety (C4)
	CLO 1. Students conceptually apply clean production and industrial waste management CLO 2. Students apply conceptually the application of sanitation in the food industry
Content	❖ Clean production ❖ Clean production strategies ❖ The principle of waste minimization ❖ Clean production techniques ❖ The application of clean production in industry. ❖ Pollution and its types waste. ❖ The processing of organic liquid waste ❖ The processing of inorganic chemical waste ❖ The processing of solid waste using landfill and composting systems ❖ The processing of solid waste through pyrolysis ❖ The principles of sanitation ❖ Apply the principles of worker sanitation, room sanitation,



	equipment sanitation and industrial environment ❖ Control systems in the food industry																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 50% ❖ Quiz: 50% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Away, Y. 1984. Mini Petification for Processing People's Chocolate. Plantation Tower 52 (6a): 250 -254 2. Beckett, S. T. 1988. Industrial Chocolate Manufacture and Use. The Blackie and Sons Ltd., London 3. Hardimandan and B. Kartika. 1980. Guidelines for Collection and Processing of Recorder Results. Cooperation of the Director General of Plantation of the Indonesian Ministry of Agriculture with the Faculty of Agricultural Technology UGM, Yogyakarta 4. Seviz, M and H. E. FOOTE. 1963. Coffee Processing Technology. Inc. Wesport, Conn 5. Fox, J.J and P. J Srageman. 1912. Caffeine, Tea and Coffe in Allenis Coomerical Organic Analysis																														
Date of last amendment	10 July 2025																														



Module Description

Application of Food Safety and Microbiology

Module designation	Application of Food Safety and Microbiology
Module code	23G03121202
Semester(s) in which the module is taught	3 rd semester
Person responsible for the module (lecturers)	❖ Arfina Sukmawati Arifin, S.TP., M.Si ❖ Dr. Ir Andi Hasizah, M.Si ❖ Dr. Fitri, S.TP
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Laboratory practice
Workload	Total workload (estimated): 91 hours of practicum
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	General Microbiology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards (S) ILO 6. Identifies microorganisms in food ingredients and processed foods, including applications in biotechnology (C3)
	CLO 1. Able to explain the principles of using tools and procedures for basic food microbiology preparation in the laboratory (media making, multilevel dilution, sterilization, inoculation techniques, and isolation) CLO 2. Able to analyze and characterize qualitatively and / or quantitative microbiology testing and food safety in food in the Food Microbiology Laboratory
Content	❖ Basic microbiology: Introduction to equipment, media making, sterilization, dilution, inoculation techniques, isolation techniques, and enumeration ❖ Analysis of the level of sanitation of the microbiology laboratory work environment ❖ Qualitative and quantitative analysis of coliform bacteria using the most probable number (MPN) method in drinking water



	❖ Characterization of microbial spoilage of fresh food materials ❖ Qualitative and quantitative analysis of food microbes using the cup counting method ❖ Analysis of total microbial contamination in drinking water using micro membranes																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Preliminary task: 15% ❖ Practicum response: 20% ❖ Final report of practicum: 40% ❖ Quiz: 25% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Black, Jacquelyn G. 2008. Microbiology: Principles and Explorations, Seventh Edition. USA: John Wiley & amp; Sons, inc 2. Mossel, C.M.L. Marengo (Auth), P.D.Patel (Eds.). 1995. Rapid Analysis Techniques in Food Microbiology. Springer 3. Ray, Bibek. 2005. Fundamental Food Microbiology (Third Edition). Taylor & amp; Francis E-Library 4. Hafsan. 2014. Mikrobiologi Analitik. Makassar: Alauddin University Press. 5. Wibowo, S., Noorahman N. F., Sandriya A. 2024. Teknik Laboratorium Mikrobiologi. Jambi: PT. Sonpedia Publishing Indonesia.																														
Date of last amendment	2 August 2025																														



Module Description

Applications of Biochemistry and Postharvest Physiology

Module designation	Applications of Biochemistry and Postharvest Physiology
Module code	23G03121302
Semester(s) in which the module is taught	4 th semester
Person responsible for the module (lecturers)	❖ Dr. Muhammad Asfar, STP., MSi ❖ Prof. Dr. Ir. Mulyati Muhammad Tahir, MS. ❖ Dr. Fitri, S.TP ❖ Serli Hatul Hidayat, STP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Laboratory practice
Workload	Total workload (estimated): 91 hours of practicum
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards (S) ILO 8. Conducts chemical and physical analysis of food to support quality management and control, including food products for special dietary purposes (C5) CLO 1. Students are able to factually replicate the analysis of biochemical changes in food ingredients CLO 2. Students are able to factually replicate the analysis of physiological changes in food CLO 3. Students are able to organize and collaborate with teams in replicating procedures for analyzing biochemical and physiological changes in postharvest food products.
Content	Differentiation of the germination process, measurement of glycogen and lactic acid content, determining the rate of respiration and respiration patterns, map (modified atmosphere packaging), chilling injury, freezing injury, enzymatic browning reaction
Examination form	Writing (essay)



Study and examination requirements	Examination requirements: Attendance above 80% ❖ Final report of practicum 60% ❖ Midterm exam 15% ❖ End of semester test 15% ❖ Presentation 10% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
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Reading list	1. Bintang, M. 2018. Biochemistry, Research Techniques. Erlangga Publisher, Jakarta 2. Sudjatha, Ni Wayan W. 2017. Textbook of Physiology and Technology Post -Harvest (Fruits and Vegetables). Udayana University Press. Denpasar.																														
Date of last amendment	11 June 2025																														



Module Description Food Processing Engineering

Module designation	Food Processing Engineering
Module code	23G03121302
Semester(s) in which the module is taught	4 th semester
Person responsible for the module (lecturers)	❖ Dr.rer.nat. Olly S. Hutabarat, S.TP., M.Si. ❖ Dr. Gemala Hardinasinta, S.TP. ❖ Muhpidah, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Analysis
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development (C6)
	CLO 1. Able to explain conceptually related to food ingredients, their physical properties and the influence of processing on the physical and chemical characteristics of food ingredients CLO 2. Able to explain conceptually related to mass and energy balance and elements of food processing operations
Content	❖ Physical properties of food ingredients, the influence of processing on the physical, chemical and sensory characteristics of food ingredients ❖ Mass and energy balance in the processing process food ❖ Drying ❖ Evaporation ❖ Extraction ❖ Cooling ❖ Freezing



	❖ Psychrometric chart																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 35% ❖ Group task: 35% ❖ Midterm exam: 15% ❖ End of semester exam: 15% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. P. Fellows; Food Processing Handbook: Principles and Practice, CRC Press, New York. 2. Romeo T. Toledo et al.; Fundamentals of Food Process Engineering (Fourth edition); Springer 3. Heldman et al.; Handbook of Food Engineering (3rd edition); CRC Press																														
Date of last amendment	9 July 2025																														



Module Description Industrial Microbiology

Module designation	Industrial Microbiology
Module code	23G03121402
Semester(s) in which the module is taught	4 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Amran, M.Si. ❖ Dr. Fitri, S.TP. ❖ Muhpidah, S.TP., M.Si
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Microbiology and Food Safety
Module objectives/ Intended Learning Outcomes (ILO)	ILO 6. Identifies microorganisms in food ingredients and processed foods, including applications in biotechnology (C3)
	CLO 1. Able to conceptually apply the selection and growth process of industrial microbiology CLO 2. Able to conceptually apply microbial applications in various industries
Content	❖ Scope and types of industrial microbes, introduction to the use of microbiology in industry, metabolic pathways for product biosynthesis in industrial microbiology ❖ Prerequisites for microbes in industry, use of microbes in the bioenergy industry (bioethanol, biodiesel) ❖ Sterility and disinfection in industrial microbiology, as well as understanding the application of microbiology in environment ❖ Applications of microbiology in the healthcare and pharmaceutical industries



	❖ Microbiology applications in the food industry (polysaccharides extracellular), and biochemical industry (organic acids) ❖ Applications of microbiology in the cosmetics industry, development of microbiology in industry																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 25% ❖ Problem based learning: 65% ❖ Quiz: 10% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Industrial Microbiology: An Introduction by: Michael J. Waites, Neil L. Morgan, John S. Rockey, Gary Higton 2. Modern Industrial Microbiology and Biotechnology by: Nduka Okafor																														
Date of last amendment	9 August 2025																														



Module Description

Food Processing Tools and Machinery

Module designation	Food Processing Tools and Machinery
Module code	23G03121603
Semester(s) in which the module is taught	4 th semester
Person responsible for the module (lecturers)	❖ Dr. Abd. Azis, S.TP, M.Si ❖ Husnul Mubarak, S.TP., M.Si
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Analysis
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development (C6)
	CLO 1. Able to factually understand operating units in the food processing industry CLO 2. Able to conceptually understand the types and working principles of machines and equipment used in each operating unit
Content	❖ Introduction to courses, scope, and learning contracts ❖ Machinery and equipment for moving and storing materials in the food industry ❖ Machinery and equipment for size reduction, homogenization, and agglomeration of materials ❖ Equipment for the mechanical separation of food materials ❖ Evaporators for food products ❖ Food product drying machines ❖ Cooling and freezing



	❖ Thermal process equipment ❖ Distillation, extraction, and crystallization equipment ❖ Equipment for separating product components: membrane technology, reverse osmosis and nano filtration ❖ Equipment for separating product components: ultrafiltration, microfiltration and pervaporation technology ❖ Supercritical extraction and fractionation ❖ Non-thermal preservation equipment ❖ Food product packaging equipment																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual tasks: 50% ❖ Project: 50% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Saravacos, George, Athanasioes E. K. 2016. Handbook of Food Processing Equipment. New York: Springer.																														
Date of last amendment	14 August 2025																														



Module Description Sensory Analysis

Module designation	Sensory Analysis
Module code	23G03131703
Semester(s) in which the module is taught	4 th semester
Person responsible for the module (lecturers)	❖ Dr. Adiansyah, STP., M.Si. ❖ Prof. Dr. Ir. Mulyati Muhammad Tahir, MS. ❖ Dr. rer.nat. Ir. Zainal, STP., M.Food.Tech. ❖ Dr. Ir. Andi Hasizah, M.Si
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture, laboratory practice
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study ❖ 45 hours of laboratory work
Credit points	3 credit points = 4.86 ECTS
Required and recommended prerequisites for joining the module	Food Analysis
Module objectives/ Intended Learning Outcomes (ILO)	ILO 8. Conducts chemical and physical analysis of food to support quality management and control, including food products for special dietary purposes (C5)
	CLO 1. Able to explain the use of human senses to observe/measure the characteristics of food products and their acceptability by consumers CLO 2. Able to explain the application of sensory analysis in controlling food quality and its use in food research and development in industry.
Content	❖ Use of sensory attributes ❖ Sensory mechanism ❖ Basic physicochemical properties in sensor tests ❖ Good sensory practice ❖ Sensory analysis method ❖ Application of statistics in sensory data processing ❖ Trial practice ❖ Ranking test practice



	❖ Threshold test practice ❖ Discriminative test practice (multiple comparison triangle)																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Final practicum: 50% ❖ Individual assessment: 30% ❖ Midterm exam: 10% ❖ End of semester: 10% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Setyaningsih, Dwi., Anton Apriyantono and Maya Puspita Sari. 2010. Sensory Analysis for the Food and Agro Industry. Larmond, Elisabeth, 1977. Laboratory Methods for Sensory Evaluation of Food. Canada Department of Agriculture Publication. 2. Stone, H. and J.L. Sidel, 1993. Sensory Evaluation Practices, 2 nd ed, Academic Press, Inc., California. 3. Resurreccion, A.V.A., 1998. Consumer Sensory Testing for Product Development. Aspen Publishers, Inc., Gaithersburg, Maryland.																														
Date of last amendment	14 August 2025																														



Module Description Postharvest Physiology and Technology

Module designation	Postharvest Physiology and Technology
Module code	23G03131802
Semester(s) in which the module is taught	4 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Mulyati Muhammad Tahir, MS. ❖ Prof. Ir. Andi Dirpan, STP., M.Si., Ph.D. ❖ Dr. Adiansyah, STP., M.Si. ❖ Prof. Dr. Andi Nurfaidah Rahman, STP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ☐ 27 hours of lecture ☐ 32 hours of exercise ☐ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 8. Conducts chemical and physical analysis of food to support quality management and control, including food products for special dietary purposes (C5)
	CLO 1. Able to conceptually apply pre-harvest and post-harvest biochemical changes CLO 2. Able to implement factually the application of post-harvest technology for Fruit and Vegetables
Content	Philosophy and post-harvest; scope of physiology and post-harvest; definition, scope and factors that play a role during respiration and transpiration; definition, benefits and effects of ethylene during ripening and after harvest; chemical changes during cooking; physiological changes during ripening; Effect of temperature on the composition of fruit and vegetables during storage, Cooling; Water and moisture loss in the process processing; growth and harvest regulator; physiological damage; fruit and vegetable storage; Quality Evaluation and post-harvest packaging



Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual tasks 12% ❖ Presentation 29% ❖ Midterm exam 6% ❖ Case study 53% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. BPOM. 2006. Natural Toxins in Food Plants. http://www.pom.go.id/mobile/index.php/view/berita/157/RA-CUN-ALAMI-PADA-FOOD-PLANTS.html. 2. Sudjatha, Ni Wayan W. 2017.Textbook of Post-Harvest Physiology and Technology (Fruit and Vegetables). Udayana University Press. Denpasar. 3. Hiola, S.K.Y. 2018.Vegetable Processing Technology. CV. Inti Mediatama. Makassar.																														
Date of last amendment	15 July 2025																														



Module Description Food Processing and Preservation Technology

Module designation	Food Processing and Preservation Technology
Module code	23G03131902
Semester(s) in which the module is taught	4 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Mulyati Muhammad Tahir, MS. ❖ Dr. Adiansyah, STP., M.Si. ❖ Dr. Andi Nurfaidah Rahman, STP., M.Si. ❖ Serli Hatul Hidayat, STP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Microbiology and Food Safety
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development (C6)
	CLO 1. Students are able to explain the basic principles of food processing including physical, chemical and biological processing as well as utilizing sustainable technology in food processing CLO 2. Students are able to differentiate the basic principles of preservation and analyze the need for preservation of food ingredients to maintain food quality and safety
Content	❖ Principles and functions of food processing and preservation ❖ Physical, chemical and biotechnological processing of food ❖ Food preservation
Examination form	Writing (essay)
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Presentation: 5% ❖ Problem based learning (midterm exam): 20%



	❖ Quiz: 35% ❖ Problem based learning: 25% ❖ Project: 15% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Tahir, M. 2008. Vegetables, Fruit, Handling and Processing. CV. Indomedia. Makassar. 2. Ashari, Sumeru. 1995. Horticultural Cultivation Aspects. University of Indonesia Publishers. Jakarta. 3. Cheng GW, Crisosto CG. 2005. Browning potential, phenolic composition, and polyphenoloxidase activity of buffer extract of peach and nectarine skin tissue. J. Amer. Soc. Horts. Sct. 120(5):835-838. 4. Davies, P.J. 1995. Plant Hormones. Physiology, Biochemistry, and Molecular Biology. Kluwer Academy Publisher, London. 5. Dwiyantri Pujimulyani. 2009. Vegetable and Fruit Processing Technology. Graha Ilmu Yogyakarta. 6. Hong Seok-In 2006. Packaging Technology for Fresh Produce. One Day International Seminar "Post-Harvest Losses of Cole Crops (Brassica vegetables): Causes and Solutions. FTIP, Unpad – Bandung. 7. Kader, A.A. 1992. Postharvest Technology of Horticultural Crops. The Regents of the University of California. USA. 8. McGregor, B.M. 1989. Tropical Products Transport Handbook. USDA Office of Transportation, Agricultural Handbook 668. 9. Wien, H.C. 1996. The Physiology of Vegetable Crops. CABI Publishing. USA.																														
Date of last amendment	1 June 2025																														



Module Description Fermentation Technology

Module designation	Fermentation Technology
Module code	23G03122002
Semester(s) in which the module is taught	4 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Amran Laga, MS ❖ Dr. Fitri, S.TP. ❖ Sunrison Carmando Yuansah, S.TP., M.T.P.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Microbiology and Food Safety
Module objectives/ Intended Learning Outcomes (ILO)	ILO 6. Identifies microorganisms in food ingredients and processed foods, including applications in biotechnology (C3)
	CLO 1. Able to explain conceptually the needs of microorganisms in the fermentation process, and metabolism and metabolite formation CLO 2. Able to explain conceptually related to the application of the production process for fermented products
Content	❖ Isolation and selection of microbes (primary and secondary) ❖ Maintenance and development of inoculum, fermentation medium, as well as the regularity and regulation of metabolism ❖ Fermenter, fermentation kinetics ❖ Purification of fermentation metabolites ❖ Fermentation products xanthan gum, organic acids, vitamins ❖ Traditional fermented and dairy products
Examination form	Writing (essay)



Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual tasks: 25% ❖ Problem-based learning: 60% ❖ Group task: 15% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. p. Fellows; Food Processing Handbook: Principles and Practice, CRC Press, New York. 2. Romeo T. Toledo et al.; Fundamentals of Food Process Engineering (Fourth edition); Springer 3. Heldman et al.; Handbook of Food Fermentation (3rd edition); CRC Press																														
Date of last amendment	24 July 2025																														



Module Description

Fishery Product Processing Technology

Module designation	Fishery Product Processing Technology
Module code	23G03122102
Semester(s) in which the module is taught	4 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Andi Nurfaidah Rahman, STP., M.Si. ❖ Dr. Muhammad Asfar, STP., MSi ❖ Dr. Adiansyah, STP., M.Si. ❖ Arfina Sukmawati Arifin, S.TP., M.Si
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development (C6)
	CLO 1. Able to explain conceptually about the scope and handling of post-harvest fishery products and their impact on the quality and safety of fishery products CLO 2. Able to explain conceptually the processing technology and preservation of fishery products
Content	❖ Fishery products after being captured ❖ The freshness and quality of fishery products ❖ Postharvest shrimp and shrimp waste treatment into chitosan ❖ Fishery products with fumigation and curing technology ❖ Technology in surimi ❖ The processing of fishery products with drying, cooling, freezing technology, fermentation and canning ❖ Processing technology: Mince, fish meal, fish oil, concentrate, isolates and hydrolyzate fish



Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Case study: 30% ❖ Individual assignments: 10% ❖ Problem based learning: 60% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. The Seafood Industry, edited by Roy E.Martin and George J.Flick 2. The Frozen Seafood Handbook, by Ian Dore.																														
Date of last amendment	11 August 2025																														



Module Description

Meat, Milk, and Egg Processing Technology

Module designation	Meat, Milk, and Egg Processing Technology
Module code	23G03122202
Semester(s) in which the module is taught	4 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Mulyati Muhammad Tahir, MS. ❖ Prof. Dr. Ir. Jumriah Langkong, MP. ❖ Dr. Ir. Andi Hasizah, M.Si
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development (C6)
	CLO 1. Able to understand factually the structure, composition, chemical, physical, functional properties, and processing technology of eggs for food
	CLO 2. Able to factually understand the technology of processing and preserving meat, milk, and eggs
Content	❖ Structure and composition of eggs ❖ Physicochemical and functional properties of eggs ❖ Structure and composition of meat ❖ Physicochemical and functional properties of meat ❖ Structure and composition of milk ❖ Physicochemical and functional properties of milk ❖ Process of preserving eggs, meat, and milk ❖ Techniques for processing eggs, meat, and milk ❖ Products resulting from egg, meat, milk processing
Examination form	Writing (essay)



Study and examination requirements	Examination requirements: Attendance above 80% ❖ Quiz: 50% ❖ Presentation: 50% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Poultry Meat and Chicken Egg Production. Carmen Rp. And George JM. Springer US 2. Commercial Chicken Egg and Meat Production. Paul WA, Donald DB, Willian DW. Springer US 3. Milk and Dairy Product Technology. SPREER AND EDGAR.2017. Taylor and Francis																														
Date of last amendment	5 August 2025																														



Module Description Starch and Sugar Processing Technology

Module designation	Starch and Sugar Processing Technology
Module code	23G03122303
Semester(s) in which the module is taught	4 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Amran Laga, MS. ❖ Prof. Dr. Ir. Jumriah Langkong, MP. ❖ Dr. Adiansyah, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture, laboratory practice
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study ❖ 45 hours of laboratory work
Credit points	3 credit points = 4.86 ECTS
Required and recommended prerequisites for joining the module	Food Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development (C6)
	CLO 1. Be able to explain the sources of starch and its characteristics CLO 2. Able to explain starch and sugar modification technology CLO 3. Able to practice starch and sugar processing (practicum)
Content	❖ Physical properties and chemistry of various sources of starch ❖ Physical and chemical modification of various starch sources ❖ Starch extraction ❖ Granulated palm sugar production practices ❖ Liquid sugar production practices ❖ Maltodextrin production practices
Examination form	Writing (essay)



Study and examination requirements	Examination requirements: Attendance above 80% ❖ Presentation: 40% ❖ Midterm exam: 15% ❖ Final practicum report: 30% ❖ Individual assignments: 15% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Miller, 2000. Starch Chemistry and Technology 2. Scientific journal of research results regarding starch profiles of various types																														
Date of last amendment	20 July 2025																														



Module Description

Applications of Animal-Based Products Processing Technology

Module designation	Applications of Animal-Based Products Processing Technology
Module code	23G03130102
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Mulyati M. Tahir, MS ❖ Prof. Dr. Ir. Jumriah Langkong, MP ❖ Dr. Ir. Andi Hasizah, M.Si. ❖ Serli Hatul Hidayah, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory
Teaching methods	Laboratory practice, group discussion, project based learning
Workload	Total workload (estimated): 91 Laboratory practice
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Meat, Milk, and Egg Processing Technology and Fishery Product Processing Technology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards (S) ILO 7. Demonstrates the ability to manage food waste effectively while ensuring food safety (C4) ILO 9. Demonstrates the ability to manage food waste effectively while ensuring food safety (C6) CLO 1. Students can conceptually apply technology to fruit and vegetable processing CLO 2. Students can conceptually apply technology to the processing of plantation products CLO 3. Students can conceptually apply technology to the processing of cereals and legumes CLO 4. Students can conceptually apply technology to rhizome processing CLO 5. Students can organize and collaborate with teams to produce plant-based product processing innovations
Content	❖ Fruit and vegetable processing technology ❖ Plantation processing technology



	❖ Cereal and legume processing technology ❖ Rhizome processing technology																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Final Report of practicum: 70% ❖ Quiz: 30% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Rahman, S., Lasumange and Yunus, A. 2023 Historical overview and contribution of Dangke as traditional food to income and public health). 2023. Food Research 7 (5) : 245 - 250. 2. Dewi, F. A., & Susanti, R. (2022). Effect of addition of carrot puree on the quality of catfish nuggets. Jurnal Teknologi dan Industri Pangan, 33(3), 213–220. 3. Gkinali, A. A., Dimopoulos, G., Paraskevopoulou, A., & Kiosseoglou, V. (2024). Egg-free mayonnaise-type emulsions stabilized with Tenebrio molitor protein isolates. Food Hydrocolloids, 153, 109034. https://doi.org/10.1016/j.foodhyd.2024.109034 4. Setiarto, R., Taufik, E., & Nuraini, E. (2025). Dangke: Unveiling Indonesian traditional fermented cheese from Enrekang. Journal of Ethnic Foods, 12(1), 45–58. https://doi.org/10.1186/s42779-025-00279-1																														
Date of last amendment	20 July 2025																														



Module Description

Fruit and Vegetable Processing Technology

Module designation	Fruit and Vegetable Processing Technology
Module code	23G03130202
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Hj. Mulyati M. Tahir, MS ❖ Prof. Dr. Andi Nur Faidah Rahman, S.TP., M.Si ❖ Dr. Muhammad Adiansyah, S.TP., M.Si. ❖ Muhpidah, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture, group discussion
Workload	Total workload (estimated): ❖ 90.67 Laboratory Practice
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Starch and Sugar Processing Technology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development (C6)
	CLO 1. Explain conceptually the characteristics of raw materials, ingredients, and food additives, and their influence on the characteristics of fruit and vegetable products CLO 2. Explain procedurally the technology for processing and controlling fruit and vegetable damage
Content	❖ Understanding of vegetables and fruits according to consumer understanding ❖ Structure and chemical composition of fruits and vegetables ❖ Physiological changes in fruit ❖ Respiration ❖ Influencing factors of respiration ❖ Ripening and changes in fruit during the ripening process ❖ Substances that slow ripening and senescence ❖ Substances that accelerate ripening and senescence



	❖ Substances that slow down or speed up cooking and senescence ❖ Substances that inhibit growth ❖ Pre-harvest factors affecting quality ❖ Cultural factors ❖ Enzymatic browning ❖ Browning non-enzymatic ❖ Temperature settings ❖ Atmosphere-controlled warehousing (KA) ❖ Product release from the warehouse ❖ Packing with plastic ❖ Fruit and Vegetable Processing and Preservation Technology																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 45% ❖ Case study: 50% ❖ Group task: 5% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Processing of Fruits and Vegetables: From Farm to Fork. 2019. Kursheed Alam Khan, Megh. H. Royal, Abhimannyu A. Kaine. Apple Academic Press. 2. Fruit and Vegetable Processing: Improving Quality. 2002. Wim Jongen 3. Research journals related to fruit and vegetable processing																														
Date of last amendment	26 July 2025																														



Module Description

Coconut, Coffee, and Cocoa Processing Technology

Module designation	Coconut, Coffee, and Cocoa Processing Technology
Module code	23G03130302
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Jumriah Langkong, MS ❖ Prof. Dr. Ir. Hj. Mulyati M. Tahir, MS ❖ Dr. Februadi Bastian, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture, group discussion
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 27 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Starch and Sugar Processing Technology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development (C6)
	CLO 1. Able to explain conceptually the concept and post-harvest handling of coconut, coffee, and cocoa CLO 2. Able to explain procedural technology for processing coconut, coffee, and cocoa
Content	❖ Latest developments regarding cocoa, coffee and coconut commodities ❖ Level of maturity and physical and chemical characteristics of cocoa, coffee and coconut fruit ❖ Food products derived from the cocoa, coffee and coconut commodity industrial trees ❖ Post-harvest handling process for cocoa, coffee and coconut commodities ❖ Process of processing and analyzing the quality of cocoa derivative products, coffee, and coconut
Examination form	Writing (essay)



Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 45% ❖ Case study: 50% ❖ Group task: 5% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Supriyanto Haryadi, 2017. Chocolate Technology. ISBN 978-979-420-788-8 2. Emmanuel Ohene Afoakwa, 2010. Chocolate Science and Technology, ISBN: 9781118913789 3. Charis Michel Galanakis (editor), 2017. Handbook of Coffee Processing By-Product 4. Lucas Louzada Pereira and Tais Rizzo Moreira. 2021. Quality Determinants In Coffee Production, Springer, ISBN: 978-3030544393 5. Yuliana Soekardi. Utilization and processing of coconut, Yrama Widya Publisher																														
Date of last amendment	20 July 2025																														



Module Description Food Biotechnology Application

Module designation	Food Biotechnology Application
Module code	23G03130402
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Dr. Fitri, S.TP. ❖ Serli Hatul Hidayat, S.TP., M.Si. ❖ Arfina Sukmawati Arifin, S.TP., M.Si. ❖ Sunrixon Carmando Yuansah, STP, M.T.P
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Laboratory practice, group discussion
Workload	❖ Total workload (estimated): ❖ 91 Laboratory practice
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Industrial Microbiology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards (S) ILO 6. Identifies microorganisms in food ingredients and processed foods, including applications in biotechnology (C3)
	CLO 1. Students are able to identify microorganisms that are isolated from food ingredients and processed food products CLO 2. Students are able to practice fermentation in the manufacture of food products, both spontaneous fermentation and using starter microorganisms, molds, yeasts, and bacteria
Content	❖ Isolation and identification of microorganisms ❖ Making fermentation starter ❖ Fermentation with mold, yeast and bacteria starter ❖ Spontaneous fermentation



Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Practical response: 12.5% ❖ Preliminary assignment: 12.5% ❖ Final report of practicum: 60% ❖ Presentation: 15% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Food Biotechnology Application Practical Module 2. Katz, S. E. (2012). The Art of Fermentation: An In-Depth Exploration of Essential Concepts and Processes from Around the World. United States: Chelsea Green Publishing. 3. Cook, D. J., Bamforth, C. W. (2019). Food, Fermentation, and Micro-organisms. United Kingdom: Wiley.																														
Date of last amendment	22 July 2025																														



Module Description Legume and Cereal Processing Technology

Module designation	Legume and Cereal Processing Technology
Module code	23G03130502
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Dr. Ir. Andi Hasizah, M.Si ❖ Prof. Dr. Ir. H. Jalil Genisa, MS ❖ Dr. Februadi Bastian, S.TP., M.Si. ❖ Serli Hatul Hidayat, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture, group discussion
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Starch and Sugar Processing Technology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development (C6)
	CLO 1. Able to conceptually understand the physical and chemical characteristics of legumes and cereals CLO 2. Able to understand procedurally the technology of processing legumes and cereals
Content	The scope of cereals and legumes; morphology, structure, chemical composition, health benefits of cereals and legumes; physical properties, grading and specialty seeds of cereals and legumes; post-harvest handling techniques for cereals and legumes and changes during storage; processing technology for cereals (rice, corn, wheat, oats) and legumes (soybeans, peanuts, green beans and other beans); and various ways of making processed cereal and legume products
Examination form	Writing (essay)



Study and examination requirements	Examination requirements: Attendance above 80% ❖ Quiz: 43% ❖ Presentation: 57% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(\$) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. John Shi, G. Mazza and Marc Le Maguer, 2002. Functional Foods: Biochemical and Processing Aspects. Vol.2, CRC Press 2. Gibson, 2000. Functional Foods: Concept to Products, CRC Press. 3. John Shi, Chi-Tang Ho, Fereidoon Shahidi, 2005. Asian Functional Foods. CRC Press. Boca Raton. 4. Muchtadi, D. 2012. Functional Foods and Bioactive Compounds, Alfabeta Publishers, Bandung 5. Rahmadi, A. and Bohari. 2018. Functional Foods with Antioxidant Efficacy, Mulawarman University Press																														
Date of last amendment	22 July 2025																														



Module Description Food Oil and Fat Processing Technology

Module designation	Food Oil and Fat Processing Technology
Module code	23G03130602
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Jumriah Langkong, MP ❖ Prof. Dr. Ir. H. Jalil Genisa, MS ❖ Dr.rer.nat Zainal, S.TP., M.FoodTech
Language	Indonesian language
Relation to curriculum	Compulsory
Teaching methods	Lecture Group Discussion
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development (C6)
	CLO 1. Able to explain conceptually the characterization of oil and fat sources and physical characterization and the chemistry CLO 2. Able to explain procedurally the technology for processing oils, fats and their derivatives
Content	❖ Benefits of oils and fats. ❖ Components and structure of fatty acids, phospholipids and fractions that do not form soap. ❖ Physico-chemical properties of oils and fats. ❖ Reactions and properties of auto-oxidation and photo-oxidation. ❖ Oil and fat processing techniques and quality standards. ❖ Oils and fats come from vegetable sources. ❖ Processing of oils and fats from vegetable sources. ❖ Processing of oils and fats sourced from fish and animals.



	❖ Common problems of oil and grease damage ❖ Flavor stability and shelf life of oils and fats. ❖ Quality testing of oils and fats. ❖ How to apply antioxidants to oils and fats. ❖ Controlling the quality of oils and fats by administering activated charcoal. ❖ How to analyze the quality of oil and fat.																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 50% ❖ Project: 50% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
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70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	Genisa, Jalil. 2013.Teknologi Minyak dan Lemak Pangan. Masagena Press: Makassar																														
Date of last amendment	2 August 2025																														



Module Description

Applications of Plant-Based Food Processing Technology

Module designation	Applications of Plant-Based Food Processing Technology
Module code	23G03130702
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Hj. Mulyati M. Tahir, MS ❖ Prof. Dr. Ir. Jumriah Langkong, MP ❖ Dr. Muhammad Asfar, S.TP., M.Si. ❖ Serli Hatul Hidayat, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Laboratory practice, group discussion
Workload	Total workload (estimated): 91 Laboratory Practice
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Starch and Sugar Processing Technology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards (S) ILO 7. Demonstrates the ability to manage food waste effectively while ensuring food safety (C4) ILO 9. Demonstrates the ability to manage food waste effectively while ensuring food safety (C6) CLO 1. Students are able to conceptually apply technology to fruit and vegetable processing CLO 2. Students are able to conceptually apply technology to the processing of plantation products CLO 3. Students are able to conceptually apply technology to the processing of cereals and legumes CLO 4. Students are able to conceptually apply technology to rhizome processing CLO 5. Students are able to organize and collaborate with teams to produce plant-based product processing innovations
Content	❖ Fruit and vegetable processing technology ❖ Plantation product processing technology



	❖ Cereal and legume processing technology ❖ Rhizome processing technology																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Final report of practicum: 70% ❖ Midterm exam: 15% ❖ End of semester exam: 15% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Sjarif, S. R., Apriani, S. W., & Apriani, S. W. (2018). Pengaruh bahan pengental pada saus tomat. Jurnal Penelitian Teknologi Industri, 8(2), 141. https://doi.org/10.33749/jpti.v8i2.2220 2. Susanti Panjaitan, T. W., Rosida, D. A., & Widodo, R. (2023). Aspek mutu dan tingkat kesukaan konsumen terhadap produk mie basah dengan substitusi tepung porang. Heuristic, 14(1). https://doi.org/10.30996/he.v14i01.1040 3. Rahmah, N., & Aulia, A. (2025). Penambahan gula pasir dengan konsentrasi berbeda pada pembuatan selai nanas. Jurnal Pendidikan Teknologi Pertanian, 8(2). https://doi.org/10.26858/jptp.v8i2.3559 4. Syamilah, D. R., & Novidahlia, N. (2024). Formulasi keripik simulasi ubi jalar ungu (Ipomoea batatas L.). Jurnal Pertanian, 7(1). https://doi.org/10.30997/jp.v7i1.27																														
Date of last amendment	4 August 2025																														



Module Description Food Packaging Technology

Module designation	Food Packaging Technology
Module code	23G03130802
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Ir. Andi Dirpan, S.TP., M.Si, Ph.D. ❖ Prof. Dr. Ir. Abu Bakar ❖ Prof. Dr. Ir. Jumriah Langkong, MP ❖ A. Hermina Julyaningsih, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture Group Discussion
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Processing and Preservation Technology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development (C6) CLO 1. Students are able to explain the concept of packaging in providing food products CLO2. Students are able to explain the function, classification and properties of packaging materials
Content	❖ Function and Classification of Packaging ❖ The Influence of Packaging on the Quality and Shelf Life of Food Ingredients ❖ Characteristics of packaging materials, quality requirements and packaging standards ❖ Technology in Packaging ❖ Graphic design and packaging design.
Examination form	Writing (essay)
Study and examination requirements	Examination requirements: Attendance above 80%



	Problem based learning: 25% Presentation: 25% Case study: 25% Individual assignment: 10% Project: 15% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> If student(s) receives(s) a score below 40, student(s) must retake the course	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
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70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Gordon, L. R. (2016). <i>Food Packaging: Principles and Practice</i> (3rd ed.). Boca Raton: CRC Press, Taylor & Francis Group. 2. Cahyadi, W. (2007). <i>Karakteristik dan Sifat Berbagai Material Kemasan</i>. [Modul/Makalah]. Institut Pertanian Bogor. 3. Dirpan, A., Ainani, A. F., & Djalal, M. (2023). A review on biopolymer-based biodegradable film for food packaging: trends over the last decade and future research. <i>Polymers</i>, 15(13), 2781. 4. Adiansyah, Dirpan, A., Langkong, J., & Rahman, A. N. F. (2024). Karakterisasi dan uji fungsional edible film komposit berbasis polisakarida/protein dengan penambahan <i>rice bran oil</i> sebagai kemasan aktif (<i>active packaging</i>). <i>Laporan Penelitian Dosen Unhas</i> (Tersedia di SINTA/Repositori Unhas). 5. Dirpan, A., Djalal, M., & Kamaruddin, I. (2022). Application of an Intelligent Sensor and Active Packaging System Based on the Bacterial Cellulose of <i>Acetobacter xylinum</i> to Meat Products. <i>Sensors</i>, 22(2), 544																														



	6. Julyaningsih, A. H., Latief, R., & Dirpan, A. (2020). The making of smart and active packaging on tuna fillet. <i>IOP Conference Series: Earth and Environmental Science</i>, 486(1), 012053. 7. Julyaningsih, A. H., Hamdani, I. M., & T Binalopa. (2024). Pelatihan Penyusunan Strategi Pengembangan Produk dan Metode Pengemasan pada UMKM Wanita Maju Bersama. <i>Jurnal ATIM</i>, 3(2). 8. Julyaningsih, A. H., & Hamdani, I. M. (2025). Penentuan Aspek Utama dalam Mendesain Kemasan Tabaro Dange Khas Luwu Menggunakan Analytical Hierarchy Process (AHP). <i>Jurnal Agritechno</i>, 18(1), 39–48.
Date of last amendment	28 July 2025



Module Description Entrepreneurship

Module designation	Entrepreneurship
Module code	23G03130802
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Dr. Muhammad Asfar, S.TP., M.Si. ❖ Dr. Letty Fudjaja, SP., M.Si. ❖ Ir. Rusli M. Rukka, SP., M.Si.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Lecture, group discussion
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Industrial Management
Module objectives/ Intended Learning Outcomes (ILO)	ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management
	CLO 1. Able to understand concepts, principles, and identify opportunities as well as develop entrepreneurial plans CLO 2. Five Pillars of Entrepreneurship in the food sector (Production, Finance, Marketing, Human Resources, and Environment)
Content	❖ The Concept of Entrepreneurship in the Context of Career Choice; ❖ Self-Potential Analysis; ❖ Characteristics and Characteristics of Potential Entrepreneurs ❖ Business Opportunities ❖ Business Model/Business Model Canvas; ❖ Marketing Aspects ❖ Production Aspects ❖ Environmental Impact Control Aspects;



	❖ Organizational and Management Aspects ❖ Financial Aspects ❖ Plan Proposal Business																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 25% ❖ Presentation: 52.5% ❖ Project: 22.5% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(§) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Rukka, RM, 2011, Textbook of Entrepreneurship-1.Makassar: Institute for Educational Studies and Development, Hasanuddin University 2. PPM Management Team, 2012. Business Model Canvas: Application in Indonesia.Jakarta: Development Center Management 3. Rukka, RM, N. Busthanul and N. Fatonny, 2018. Spinach Chips Business Development Strategy.Journal of Agricultural Socioeconomics, Vol. 14 (1), pages 41 – 54. http://journal.unhas.ac.id/index.php/jsep/article/view/3622 4. Rukka, RM, 2009. Knowing Yourself and Actualizing Potential Entrepreneurship: Workbook in 7 Entrepreneurship Learning Modules. Makassar: Department of Agricultural Socioeconomics, Faculty of Agriculture, Hasanuddin University. 5. Publication of articles related to Entrepreneurship																														
Date of last amendment	23 July 2025																														





Module Description Enzyme Technology

Module designation	Enzyme Technology
Module code	23G03131002
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Amran Laga, MS ❖ Muhpidah, S.TP., M.Si ❖ Dr. Fitri, S.TP ❖ Sunrixon Carmando Yuansah, S.TP., M.T.P.
Language	Indonesian language
Relation to curriculum	Elective course
Teaching methods	Lecture, laboratory practice
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study ❖ 96 hours of laboratory practice
Credit points	3 credit points = 4.86 ECTS
Required and recommended prerequisites for joining the module	Food Chemistry, Fermentation Technology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management ILO 6. Identifies microorganisms in food ingredients and processed foods, including applications in biotechnology
	CLO 1. Able to understand the characterization of the properties and nomenclature system of enzymes CLO 2. Able to explain and practice enzyme production and purification CLO 3. Able to understand the application of enzymes in industry
Content	❖ Principles of enzymatic reactions ❖ Factors that influence enzymatic reactions



	❖ Enzyme nomenclature system ❖ Sources of enzymes ❖ Media formulation and growth of enzyme-producing microbes ❖ Enzyme preparation and purification ❖ Enzyme immobilization ❖ Enzyme kinetics ❖ Application of carbohydrase enzymes (alpha-amylase, beta-amylase, pullulanase, glucoamylase, glucoisomerase, cellulase, and pectinase) ❖ Application of protease and catalase enzymes ❖ Application of lipase enzyme ❖ Enzyme production, enzyme immobilization, enzyme application (carbohydrase and protease) (practicum)																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 35% ❖ End of semester exam: 15% ❖ Final practicum report: 20% ❖ Project: 30% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
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50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Crueger W. and A. Crueger. 1984. Biotechnology: A Textbook of Industrial Microbiology. Sinauer Ass. Inc. Sunderland.																														



	2. Demain AL. and NA Solomon. 1986. Manual of Industrial Microbiology and Biotechnology. American Society for Microbiology. Washington. 3. Doelle HW, DA Mitchell, and CE Rolz. 1992. Solid substrate Cultivation. Elsevier App Sci. London and New York. 4. Scragg AH. 1991. Bioreactors in Biotechnology. A Practical Approach. Ellis Horwood. New York and London. 5. Stanbury PF and A Whitaker. 1984. Principles of Fermentation Technology. Pergamon Press. Oxford, New York, and Toronto
Date of last amendment	11 August 2025



Module Description Spice and Essential Oil Processing Technology

Module designation	Spice and Essential Oil Processing Technology
Module code	23G03131102
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Jumriah Langkong, MP ❖ Prof. Dr. Ir. Jalil Genisa, MS ❖ Dr. Februadi Bastian, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Elective course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development CLO 1. Students can find out the types of spice plants that are widely used as ingredients in food CLO 2. Students can evaluate the technology for extracting active ingredients and processing spice plants for their use in food CLO 3. Students know the chemical components and benefits of essential oils, especially those from spice plants in industry especially in the food industry CLO 4. Students can evaluate the use of essential oils in the food industry
Content	❖ Types of spice plants and their uses in the food sector ❖ Active ingredient extraction and plant processing technology spices and processing tools and machines



	❖ Physico-Chemical Properties of Oil Atsiri, ❖ Utilization of essential oils in materials food ❖ Oil Quality Testing Essential																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 45% ❖ Project: 55% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(\$) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Lipids, Lipophilic Components and Essential Oils from Plant Sources. Shaknoza SA, Anna IG, Valentina IW. Springer 2. Spice & Community Home Garden Herbs: Diversity, Phytopharmaceutical Sources and Health and Wellness Tourism, 2015. Luchman Hakim, Publisher: Diandra Creative.																														
Date of last amendment	10 August 2025																														



Module Description Functional Foods

Module designation	Functional Foods
Module code	23G03131202
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Meta Mahendradatta ❖ Dr.rer.nat Zainal, S.TP., M.FoodTech ❖ Dr. Februadi Bastian, S.TP., M.Si. ❖ Muhpidah, S.TP., M.Si.
Language	Indonesian and English language
Relation to curriculum	Elective course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development
	CLO 1. Able to understand factually the types of active ingredients and their functional properties for health CLO 2. Able to understand procedurally functional food processing technology
Content	This course teaches about the meaning of functional food, types, functions and efficacy of bioactive food components, Asian functional food, seafood and by-products, fiber, colonic functional food, tocopherol, isoflavones, lycopene, functional components of onions, pectin, medicinal plants/herbs
Examination form	Writing (essay)



Study and examination requirements	Examination requirements: Attendance above 80% ❖ Quiz: 7% ❖ Individual assignments: 36% ❖ Presentation: 32% ❖ Case study: 25% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. John Shi, G. Mazza and Marc Le Maguer, 2002. Functional Foods: Biochemical and Processing Aspects. Vol.2, CRC Press 2. Gibson, 2000. Functional Foods: Concept to Products, CRC Press. 3. John Shi, Chi-Tang Ho, Fereidoon Shahidi, 2005. Asian Functional Foods. CRC Press. Boca Raton. 4. Muchtadi, D. 2012. Functional Foods and Bioactive Compounds, Alfabeta Publishers, Bandung 5. Rahmadi, A. and Bohari. 2018. Functional Foods with Antioxidant Efficacy, Mulawarman University Press																														
Date of last amendment	10 August 2025																														



Module Description Production Planning and Control

Module designation	Production Planning and Control
Module code	23G03131202
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Andi Dirpan, S.TP., M.Si., Ph.D ❖ Muhpidah, S.TP., M.Si. ❖ A. Hermina Julyaningsih, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Elective course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Industrial Management
Module objectives/ Intended Learning Outcomes (ILO)	ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management ILO 8. Conducts chemical and physical analysis of food to support quality management and control, including food products for special dietary purposes ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development CLO 1. Students are able to understand the basic concepts of the production system, forecasting, and develop production planning and capacity effectively. CLO 2. Students are able to apply inventory planning, production control, and completion of case studies in the context of the food industry.
Content	On courses Production Planning and Control students will learn about concepts basic production processes, forecasting



	product demand, preparing master schedules production, production capacity planning, material inventory planning, short-term production planning, production control systems, and studies cases in the food industry.																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Problem based learning (midterm test): 25% ❖ Problem based learning: 25% ❖ Individual assignments: 5% ❖ Group task: 5% ❖ Case study: 40% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Arnold, J. R. T., Chapman, S. N., & Clive, L. M. (2018). Introduction to Materials Management (8th ed.). Pearson. 2. Chary, S. N. (2009). Production Planning and Control: A Practical Approach. Tata McGraw-Hill Education. 3. Heizer, J., Render, B., & Munson, C. (2020). Operations Management: Sustainability and Supply Chain Management (13th ed.). Pearson. 4. Hopp, W. J., & Spearman, M. L. (2011). Factory Physics (3rd ed.). Waveland Press. 5. Sinulingga, S. (2015). Perencanaan dan Pengendalian Produksi (Edisi 3). Graha Ilmu.																														
Date of last amendment	8 August 2025																														



Module Description Operational Research

Module designation	Operational Research
Module code	23G03131402
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Andi Dirpan, S.TP., M.Si., Ph.D ❖ Dr. Februadi Bastian S.TP., M.Si. ❖ A. Hermina Julyaningsih, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Elective course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Industrial Management
Module objectives/ Intended Learning Outcomes (ILO)	ILO 4. Demonstrates the ability to make strategic decisions in food science and technology based on scientific data analysis and big data interpretation ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management CLO 1. Students are able to formulate problems related to agricultural engineering into research operations models
Content	Linear Programming, Networking, Transport, Assignment, CPM/PERT, and Inventory
Examination form	Writing (essay)
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Problem based learning: 40% ❖ Case study: 50%



	❖ Individual assignments: 5% ❖ Group task: 5% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	Introduction to Operations Research 7th Edition by Hiller & Lieberman																														
Date of last amendment	10 August 2025																														



Module Description Storage and Warehousing Technology

Module designation	Storage and Warehousing Technology
Module code	23G03131502
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Jumriah Langkong, MP ❖ Prof. Dr. Ir. Jalil Genisa, MS ❖ A. Hermina Julyaningsih, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Elective course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Industrial Management
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development
	CLO 1. Students are able to explain the concept of food product storage technology CLO 2. Students are able to explain the concept of food product warehousing technology
Content	❖ Storage Principles and Warehousing ❖ Storage Technology ❖ Function and Role Storage ❖ Factors Affecting Storage and Warehousing ❖ Warehouse Layout Warehouse Management
Examination form	Writing (essay)
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Problem based learning: 70%



	❖ Individual assignments: 5% ❖ Group task: 5% ❖ Case study: 20% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Bud Evans. Food Storage and Preservations. 2012. Springer 2. Irwin AT and R. Paul Singh. Storage Stability. 1998. CRC Press 3. Arpah. 2001. Books and Monographs on Determining Expiration Product. Science Study Program Food. Bogor Agricultural Institute. Bogor. 4. National Standardization Agency. 1992. SNI 01-2983-1992: Instant Coffee. Standardization Body National. Jakarta. 5. Christam Herry Wijaya. 2007. Estimating the Shelf Life of Coffee Products Instant Formula Brand-Z Using the Arrhenius Method. IPB Fateta Thesis. Http://repository.ipb.ac.id 6. Syarif, R, and H. Halid.1993. Food Storage Technology. Intermediate Study Center University. IPB. Bogor.																														
Date of last amendment	9 August 2025																														



Module Description Healthy Food Processing Technology

Module designation	Healthy Food Processing Technology
Module code	23G03131402
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Meta Mahendradatta ❖ Dr.rer.nat. Zainal, S.TP., M.FoodTech. ❖ Dr. Februadi Bastian S.TP., M.Si.
Language	Indonesian and English language
Relation to curriculum	Elective course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Chemistry
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development
	CLO 1. Able to explain conceptually related to healthy food trends CLO 2. Able to explain conceptually related to healthy food processing technology
Content	❖ Introduction (functional foods, food supplements and healthy food) ❖ Food pyramid and My Plate ❖ World healthy food trends (processing technology current food / health conditions in the world) ❖ Development of healthy food technology in Indonesia (healthy food processing technology in Indonesia / eseha conditions) ❖ Food Processing Technology for Health digestion (Prebiotics, Probiotics, Fermented milk (Yoghurt, Yakult, Benecol), Smoothies, lassie, fruit juice milk, Juice mixed with various fruits)



	❖ Healthy low calorie food processing technology (Fat replacer, Low carbohydrate) ❖ Healthy Food Processing Technology low GI (Bakery products, Breakfast cereal, Pasta) ❖ Rich Healthy Food Processing Technology antioxidants (Soy-based products (Soyjoy), Sweet potato-based products, Products rich in flavonoids) ❖ Food Supplement Processing Technology (Albumin based, Fiber based, Pigment based) ❖ Foods for detoxification																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 40% ❖ Case study: 45% ❖ Presentation: 15% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. John Shi, Chi-Tang Ho, Fereidoon Shahidi, 2005. Asian Functional Foods. CRC Press. Boca Raton. 2. Meta Mahendradatta. 2007. Pangan Sehat dan Aman. Lembaga Penerbitan Unhas. Makassar 3. Muchtadi, D. 2012. Pangan Fungsional dan Senyawa Bioaktif, Penerbit Alfabeta, Bandung 4. Agnes Murdiati dan Amaliah. 2013. Panduan Penyiapan Pangan Sehat untuk Semua. Kencana. Jakarta.																														



	5. Murdijati Gardjito, Anton Duwardi dan Eni Harmayani. 2013. Pangan Nusantara. Karakteristik dan Prospek untuk Percepatan Diversifikasi Pangan. Kencana. Jakarta. 6. Winiati P. Rahayu and Lee Kim Lian. 2020. The Uniqueness of Asean Food. IPB Press. Bogor. 7. Akoh, Casimir C. 1998. Fat Replacer. Food Technology. Vol .52 (3), p.47 – 53 8. Rahayu, Endng S. 2011. Tren Pengembangan Probiotik dan Prebiotik. Food Review, Januari. 9. Granato D, Branco G.F., Nassaro F., Cruz A.G., dan Faria J.A.F. 2010. Functional Food and Non-Dairy Probiotic Food Development: Trend, Concept, and Product. 10. Edy.Y.S.2002. Terapi Sayuran. Prestasi Pustaka. Jakarta. 11. Susiloretani.A.K. 2014. Pedoman Gizi sebagai Instrumen Pendidikan Gizi dalam Ilmu Gizi Teori dan Aplikasi. Penerbit Buku Kedokteran.EGC. Jakarta 12. Slaga.T.J.2002. The Detox Revolution PT. Buana Ilmu Populer. Jakarta 13. Rimbawan dan Albines.2004. Indeks Glikemik Pangan. Penebar Swadaya. Jakarta 14. Lewia.W.H and Memory. P.P.L. 2003. Medical Botani: Plants Affecting Human Healty. Second Edition 15. Urban. G.L and Jhon.R.H. 1999. Desain and Marketing of New Products. Second Edition. Prentice Hall. New Jersey 07632
Date of last amendment	11 August 2025



Module Description HACCP

Module designation	HACCP
Module code	23G03131702
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Ir. Abu Bakar ❖ Dr. Muhammad Asfar, S.TP., M.Si. ❖ Arfina Sukmawati Arifin, S.TP., M.Si. ❖ Sunrixon Yuansa Cormando, S.TP., M.T.P
Language	Indonesian language
Relation to curriculum	Elective course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Microbiology and Food Safety
Module objectives/ Intended Learning Outcomes (ILO)	ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management ILO 8. Conducts chemical and physical analysis of food to support quality management and control, including food products for special dietary purposes
	CLO 1. Able to explain factually the concept, scope and components of HACCP CLO 2. Able to explain factually regarding the implementation of HACCP in the food industry
Content	❖ Concept, scope and components of HACCP ❖ Pre-requisite program ❖ 5 initial steps of HACCP ❖ 7 basic principles of the HACCP system ❖ Implementation of HACCP in the food industry



Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Group task: 70% ❖ Quiz: 20% ❖ Problem based learning: 10% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Tony Mayes and Sara Mortimore. 2001. Making the most HACCP. Cambridge: Woodhead Publishing Limited 2. United States Department of Agriculture (USDA). 1997. Guidebook for the preparation of HACCP plans 3. Indonesian National Standard (SNI 01-4852-1998) concerning Hazard Analysis and Critical Point Control (HACCP) systems and guidelines implementation																														
Date of last amendment	23 March 2024																														



Module Description Food Waste Utilization Technology

Module designation	Food Waste Utilization Technology
Module code	23G03131802
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Dr. Jumriah Langkong, MP ❖ Prof. Dr. Ir. Jalil Genisa, MS ❖ Muhpidah, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Elective course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	
Module objectives/ Intended Learning Outcomes (ILO)	ILO 7. Demonstrates the ability to manage food waste effectively while ensuring food safety
	CLO 1. Students are able to explain the scope, types of waste, and characteristics of agricultural waste CLO 2. Students are able to explain waste utilization technology
Content	❖ Scope and efforts to overcome waste ❖ Processing waste from food crops, plantations, fisheries and livestock ❖ Handling of rice waste for industry ❖ Potential forestry waste ❖ Processing of fruit and tuber waste ❖ Impact of agricultural waste on public health ❖ Utilization of waste as a source of gasification energy
Examination form	Writing (essay)



Study and examination requirements	Examination requirements: Attendance above 80% ❖ Individual assignments: 12% ❖ Case study: 88% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
85 - 100	A	4.00																													
80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	Jenie, Betty Sri Laksmi; Rahayu, Winiati Praise. (1996). Handling food industry waste, Betty Sri Laksmi Jenie, Winiati Pudji Rahayu. : Canisius.																														
Date of last amendment	23 August 2025																														



Module Description

Food Industry Layout and Planning

Module designation	Food Industry Layout and Planning
Module code	23G03131902
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Prof. Andi Dirpan, S.TP., M.Si., Ph.D ❖ Prof. Dr. Ir. Mulyati M. Tahir, MS ❖ A. Hermina Julyaningsih, S.TP., M.Si. ❖ Serli Hatul, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Elective course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Food Processing Engineering,
Module objectives/ Intended Learning Outcomes (ILO)	ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development
	CLO 1. Students are able to explain the principles of food industry layout CLO 2. Students are able to explain the layout of the food industry
Content	❖ Basics of layout design factory ❖ Product analysis and process analysis techniques ❖ Factory Layout Material Flow ❖ Relationship of factory activities ❖ Equipment in the factory ❖ Calculation of area and types of rooms ❖ Computer Aided Layout of Factory Layout



	❖ Factory Location Evaluation Criteria																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Problem based learning: 50% ❖ Case study: 25% ❖ Project: 15% ❖ Individual assignments: 10% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
Numerical range	Letter grade	Conversion value																													
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80 - < 85	A-	3.75																													
75 - < 80	B+	3.50																													
70 - < 75	B	3.00																													
65 - < 70	B-	2.75																													
60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. CGJ Baker. 2013. Handbook of Food Factory Design. Springer-Verlag-New York 2. T Holah and HLM Lelieveld. 2011. Hygebic Design of food factories. Woodhead Publishing																														
Date of last amendment	23 August 2025																														



Module Description Seaweed Processing Technology

Module designation	Seaweed Processing Technology
Module code	23G03132002
Semester(s) in which the module is taught	5 th semester
Person responsible for the module (lecturers)	❖ Dr. Ir. Andi Hasizah, M.Si. ❖ Arfina Sukmawati Arifin, S.TP., M.Si. ❖ Muhpidah, S.TP., M.Si.
Language	Indonesian language
Relation to curriculum	Elective course
Teaching methods	Lecture
Workload	Total workload (estimated): ❖ 27 hours of lecture ❖ 32 hours of exercise ❖ 32 hours of independent study
Credit points	2 credit points = 3.24 ECTS
Required and recommended prerequisites for joining the module	Fishery Product Processing Technology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 2. Demonstrates a comprehensive understanding of theoretical concepts and technological literacy related to food science and technology principles and food law to support professional expertise in food science and technology ILO 9. Exhibits advanced skills in food technology from post-harvest handling, food processing, packaging, to food product development CLO 1. Able to understand factually the physical and chemical characteristics of seaweed CLO 2. Able to explain procedurally about seaweed processing technology
Content	❖ Seaweed sustainability: food, non-food applications and uses ❖ Chemical composition of seaweed ❖ Proteins, peptides and amino acids from seaweed



	❖ Carbohydrates and micro compounds from seaweed ❖ Extraction of biomolecules from seaweed ❖ Extraction with the help of microwaves and enzymes, supercritical fluid and ionic fluid, conventional extraction of seaweed: solvent extraction and hydrothermal processing extraction (emerging solve techniques) ❖ Purification of polysaccharides from seaweed using membrane technology, chromatographic methods ❖ Seaweed drying technique and processing (agar-agar, alginate, kappa-iota carrageenan) ❖ Seaweed: nutraceutical and healthy food (nori, seaweed soup, etc.)																														
Examination form	Writing (essay)																														
Study and examination requirements	Examination requirements: Attendance above 80% ❖ Quiz: 50% ❖ Project: 50% Grading: <table><tr><th>Numerical range</th><th>Letter grade</th><th>Conversion value</th></tr><tr><td>85 - 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - < 85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.50</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.00</td></tr><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.50</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</td></tr></table> <i>If student(s) receives(s) a score below 40, student(s) must retake the course</i>	Numerical range	Letter grade	Conversion value	85 - 100	A	4.00	80 - < 85	A-	3.75	75 - < 80	B+	3.50	70 - < 75	B	3.00	65 - < 70	B-	2.75	60 - < 65	C+	2.50	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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60 - < 65	C+	2.50																													
50 - < 60	C	2.00																													
40 - < 50	D	1.00																													
< 40	E	0.00																													
Reading list	1. Seaweed Sustainability: Food and Non-Food Applications, edited by: Brijesh K. Tiwari and Declan J. Troy 2. Advances in Green and Sustainable Chemistry, Sustainable Seaweed Technologies: Cultivation, Biorefinery, and Applications, edited by: Maria Dolores Torres, Stefan Kraan and Herminia Dominguez.																														
Date of last amendment	16 March 2024																														



Module Description Competency Strengthening Courses

Development and Strengthening of Entrepreneurship

Module designation	Development and Strengthening of Entrepreneurship
Semester(s) in which the module is taught	6 th semester
Person responsible for the module (lecturers)	❖ Prof. Makkarennu, S.Hut., M.Si., Ph.D. ❖ Dr. dr. Masyita Muis, MS.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Project-Based Learning (PjBL); Problem-Based Learning (PBL); Entrepreneurial Simulation; Collaborative Learning; Field Study
Workload	❖ Minimal Activity: $4 \times 170 \times 16 = 10,880$ minutes (181.33 hrs) ❖ Maximal Activity: $20 \times 170 \times 16 = 54,400$ minutes (906.67 hrs)
Credit points	1 - 20 credit points equal to 1.62 - 32.38 ECTS (adjusted to activity hours)
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	In terms of knowledge: Students will be able to apply entrepreneurial concepts; develop leadership, communication, collaboration, and soft skills; demonstrate entrepreneurial character, sociopreneurship, and technopreneurship; generate business ideas and identify business opportunities; design business models; and create collaborative business plans through internships and mentoring activities.
Content	1. Introduction to Entrepreneurial Competencies through an entrepreneurial mindset (entrepreneurial motivation, entrepreneurial character, communication skills, teamwork, leadership) 2. Sociopreneurship and Technopreneurship 3. Character Mapping 4. Business Model Development through the Business Model Canva 5. Business Model Implementation



	6. Internship with Partners 7. Dissemination of Business Ideas 8. Enhancement of Entrepreneurial Experience 9. Entrepreneurship and Business Development Incubation 10. Product Expo / Socialization / Promotion
Examination form	Portofolio, Activity Log-Book, and Certificate
Study and examination requirements	Students are required to complete all learning components of the course through a performance-based assessment system consisting of a Portfolio, Activity Log-Book, and Certificate.
Reading list	1. Ananda, R. & Rafida, T. (2016). Pengantar Kewirausahaan: Rekayasa Akademik Melahirkan Entrepreneurship. Medan: Perdana Publishing. 2. Basrowi. (2011). Kewirausahaan untuk Perguruan Tinggi. Bogor: Ghalia Indonesia. 3. Hisrich, R.D., Peters, M.P. & Shepherd, D.A. (2008). Kewirausahaan. New York: McGraw-Hill; Penerbit Salemba Empat. 4. Osterwalder, A. & Pigneur, Y. (2010). Business Model Generation. Hoboken, New Jersey: John Wiley & Sons, Inc. 5. Unit Pengembangan Kewirausahaan dan Bisnis Universitas Hasanuddin. (Ed.). (Edisi ke-2). Buku Ajar Kewirausahaan Terapan. Makassar: Universitas Hasanuddin. 6. Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi. Buku Panduan Kegiatan Mahasiswa Wirausaha (PMW). 7. SEDS Project. (2015). Modul SEDS Project.
Date of last amendment	August 2024



Practice in the Business and Industrial World

Module designation	Practice in the Business and Industrial World
Semester(s) in which the module is taught	6 th semester
Person responsible for the module (lecturers)	❖ Abdullah Sanusi, S.E., MBA., Ph.D. ❖ Dr. Ir. A. Amidah Amrawaty, S.Pt., M.Si., IPM
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Project-Based Learning (PjBL); Problem-Based Learning (PBL); Entrepreneurial Simulation; Collaborative Learning; Field Study
Workload	❖ Minimal Activity: $4 \times 170 \times 16 = 10,880$ minutes (181.33 hrs) ❖ Maximal Activity: $20 \times 170 \times 16 = 54,400$ minutes (906.67 hrs)
Credit points	1 - 20 credit points equal to 1.62 - 32.38 ECTS (adjusted to activity hours)
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	In terms of knowledge: Students are able to understand and apply the concepts, planning, implementation, and evaluation of internship activities in the business and industrial sectors through problem identification, program design and implementation, as well as professional reporting and presentation of the results.
Content	1. Learning contract and introduction to internship and practical work 2. Methods and stages of problem identification and approaches to formulating problem solutions 3. Methods for developing work programs, guidelines for preparing preliminary reports, and techniques for presenting preliminary reports 4. Guidelines for the final report format 5. Guidelines for implementing participatory and empowerment-based work programs 6. Guidelines and format for preparing mid-term reports and procedures for presenting mid-term reports



	7. Guidelines and format for preparing final reports and procedures for presenting final reports
Examination form	Portofolio, Activity Log-Book, and Certificate
Study and examination requirements	Students are required to complete all learning components of the course through a performance-based assessment system consisting of a Portfolio, Activity Log-Book, and Certificate.
Reading list	1. Kementerian Pendidikan dan Kebudayaan. (2020). Buku Panduan Merdeka Belajar – Kampus Merdeka. Direktorat Jenderal Pendidikan Tinggi. 2. Universitas Hasanuddin. Peraturan Rektor tentang Pembelajaran di Luar Program Studi
Date of last amendment	August 2024



Character Development of Humanism (Humanitarian Project)

Module designation	Character Development of Humanism (Humanitarian Project)
Semester(s) in which the module is taught	6 th semester
Person responsible for the module (lecturers)	❖ Dr. Ida Leida M. Thaha, SKM, MKM, MScPH ❖ Dr. Wahiduddin, SKM, M.Kes.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Project-Based Learning (PjBL); Problem-Based Learning (PBL); Entrepreneurial Simulation; Collaborative Learning; Field Study
Workload	❖ Minimal Activity: $4 \times 170 \times 16 = 10,880$ minutes (181.33 hrs) ❖ Maximal Activity: $20 \times 170 \times 16 = 54,400$ minutes (906.67 hrs)
Credit points	1 - 20 credit points equal to 1.62 - 32.38 ECTS (adjusted to activity hours)
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	In terms of knowledge: Students able to explain the concepts and management, analyze, and participate in disaster management, response to extraordinary events (outbreaks) and the COVID-19 pandemic, as well as in addressing social issues within the community.
Content	1. Disaster management 2. Pandemic and extraordinary event (outbreak/COVID-19) response program 3. Community social problem handling program
Examination form	Portfolio, Activity Log-Book, and Certificate
Study and examination requirements	Students are required to complete all learning components of the course through a performance-based assessment system consisting of a Portfolio, Activity Log-Book, and Certificate.
Reading list	1. Ministry of Education and Culture. (2020). Freedom to Learn – Independent Campus (Merdeka Belajar – Kampus Merdeka) Guidebook. Directorate General of Higher Education. 2. Gregg, M.B. (2012). Field Epidemiology (3rd ed.). Oxford University Press.



	3. Center for Health Problem Management, Secretariat General of the Ministry of Health & Faculty of Public Health, University of Indonesia. (2001). Preparedness and Emergency Response Management in Disaster and Emergency Management. Jakarta: Ministry of Health of the Republic of Indonesia. 4. The Sphere Project. (2011). Humanitarian Charter and Minimum Standards in Humanitarian Response. Geneva: The Sphere Project. 5. Ministry of Health of the Republic of Indonesia. (July 2020). Guidelines for the Prevention and Control of Coronavirus Disease (COVID-19). Jakarta: Ministry of Health of the Republic of Indonesia.
Date of last amendment	August 2024



Independent Research

Module designation	Independent Research
Semester(s) in which the module is taught	6 th semester
Person responsible for the module (lecturers)	❖ Dr. Mahatma Lanuru ❖ Sahriyanti Saad, S.Hut., M.Si., Ph.D
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Project-Based Learning (PjBL); Problem-Based Learning (PBL); Entrepreneurial Simulation; Collaborative Learning; Field Study
Workload	❖ Minimal Activity: $4 \times 170 \times 16 = 10,880$ minutes (181.33 hrs) ❖ Maximal Activity: $20 \times 170 \times 16 = 54,400$ minutes (906.67 hrs)
Credit points	1 - 20 credit points equal to 1.62 - 32.38 ECTS (adjusted to activity hours)
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	In terms of knowledge: - Students are able to collaborate and demonstrate social awareness and concern for community and environmental issues. - Students are able to apply logical, critical, systematic, and innovative thinking in the context of developing or implementing science and technology while considering and applying humanistic values relevant to their field of study. - Students are able to utilize technology for the development and implementation of science and technology based on scientific principles, procedures, and ethics to produce effective solutions. Students are able to write research reports and disseminate research findings.
Content	1. Concept of problem identification using a scientific approach 2. Research design 3. Research methods 4. Data analysis



	5. Concept of writing research reports or scientific papers
Examination form	Portofolio, Activity Log-Book, and Certificate
Study and examination requirements	Students are required to complete all learning components of the course through a performance-based assessment system consisting of a Portfolio, Activity Log-Book, and Certificate.
Reading list	1. Directorate General of Higher Education. (2021). Teaching Campus Program Guidebook (Batch 3). Ministry of Education and Culture. 2. Directorate General of Higher Education. (2020). Freedom to Learn – Independent Campus (Merdeka Belajar – Kampus Merdeka) Guidebook. Ministry of Education and Culture. 3. Ismayani, A.S.M. (2019). Research Methodology. Banda Aceh: Syiah Kuala University Press. 4. Wibowo, A.E. (2021). Research Methodology: A Guide to Writing Scientific Papers. Yogyakarta: Insania Publisher. 5. Hasanuddin University. (2016). Hasanuddin University Research Strategic Plan 2016–2025. Makassar: Hasanuddin University. 6. Ministry of Research, Technology, and Higher Education. (2017). National Research Master Plan (RIRN) 2017–2045. Jakarta: Kemenristekdikti.
Date of last amendment	August 2024



Creativity and Innovation Development

Module designation	Creativity and Innovation Development
Semester(s) in which the module is taught	6 th semester
Person responsible for the module (lecturers)	❖ Muhammad Kurnia, S.Pi., M.Sc., Ph.D. ❖ Dr. dr. Mashita
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Project-Based Learning (PjBL); Problem-Based Learning (PBL); Entrepreneurial Simulation; Collaborative Learning; Field Study
Workload	Activity: $20 \times 170 \times 16 = 54,400$ minutes (906.67 hrs)
Credit points	1 - 20 credit points equal to 1.62 - 32.38 ECTS (adjusted to activity hours)
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	In terms of knowledge: ❖ Student able to apply hard and soft skills through teamwork and multidisciplinary collaboration in managing and developing village potential as a solution to existing rural problems. ❖ Student able to make appropriate decisions based on information and data analysis in the field of rural development and social change. ❖ Student able to master systems, problem identification processes, analytical methods, and relevant knowledge in the application of information and communication technology as tools for solving field problems. ❖ Student able to examine the implications of science and technology development by considering and applying humanistic values in accordance with their field of expertise, based on scientific principles, procedures, and ethics, to generate solutions, ideas, designs, or artistic critiques.
Content	1. Introduction and explanation of the scope of creativity and innovation development in the community (village project) 2. Coordination with partners (government and non-government) for program strengthening



	3. General and specific briefing sessions 4. Observation and identification of village potentials and problems 5. Program seminar 6. Program implementation 7. Program evaluation seminar 8. Continued program implementation 9. Final seminar, reporting, and assessment
Examination form	Portofolio, Activity Log-Book, and Certificate
Study and examination requirements	Students are required to complete all learning components of the course through a performance-based assessment system consisting of a Portfolio, Activity Log-Book, and Certificate.
Reading list	1. Ministry of Research, Technology, and Higher Education. Guidelines for the KKN-PPM Program in Higher Education. Jakarta: Kemenristekdikti. 2. Hasanuddin University. Guidelines and Implementation Manual for the KKN Program. Makassar: Hasanuddin University. 3. Shahab, K. (2017). Rural Sociology. Yogyakarta: Ar-Ruzz Media. ISBN 979-25-4432-1. 4. Rahardjo. (2017). Introduction to Rural and Agricultural Sociology. Yogyakarta: Gadjah Mada University Press. ISBN 978-979-420-555-6. 5. Supriatna, T. (2000). Development Strategy and Poverty. Jakarta: Rineka Cipta. ISBN 979-518-805-4. 6. Community Service Publications.
Date of last amendment	August 2024



Communication and Social Interaction (Teaching Campus Program)

Module designation	Communication and Social Interaction (Teaching Campus Program)
Semester(s) in which the module is taught	6 th semester
Person responsible for the module (lecturers)	❖ Prof. Makkarennu, S.Hut., M.Si., Ph.D. ❖ A. Suci Wahyuni, S.H., M.Kn.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Project-Based Learning (PjBL); Problem-Based Learning (PBL); Entrepreneurial Simulation; Collaborative Learning; Field Study
Workload	Activity: $20 \times 170 \times 16 = 54,400$ minutes (906.67 hrs)
Credit points	1 - 20 credit points equal to 1.62 - 32.38 ECTS (adjusted to activity hours)
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	In terms of knowledge: ❖ Students are able to internalize ethics in communication, collaboration, and social interaction (Attitude); ❖ Students are able to develop leadership, soft skills, and character in innovating and collaborating with teachers to improve the quality of learning (Specific Skills); ❖ Students are able to demonstrate critical thinking skills in cross-disciplinary collaboration (Specific Skills); ❖ Students are able to maintain and develop professional networks with supervisors, colleagues, and peers (General Skills).
Content	1. Introductory Material: Program overview, activities, and roadmap 2. Observation activities at the assigned educational unit, focusing on the following aspects: a. Environment (physical facilities/infrastructure, social environment, academic climate, and atmosphere) b. Educational unit administration (school management) c. Use of technology d. Educational organization structure e. Observation of the learning process



	3. Problem identification and initial assessment (diagnostic assessment) 4. Activity program design and program design seminar 5. Program implementation evaluation seminar 6. Preparation of implementation and final activity reports 7. Dissemination of program implementation outcomes
Examination form	Portofolio, Activity Log-Book, and Certificate
Study and examination requirements	Students are required to complete all learning components of the course through a performance-based assessment system consisting of a Portfolio, Activity Log-Book, and Certificate.
Reading list	1. Ministry of Education, Culture, Research, and Technology. Teaching Campus Program Activity Guidebook. Directorate General of Higher Education. 2. Books related to teaching, tutorials, and other educational references. 3. Teaching Campus Student Orientation Videos available on the Dikti Kampus Mengajar YouTube channel.
Date of last amendment	August 2024



Leadership and National Defense Character (State Defense Program)

Module designation	Leadership and National Defense Character (State Defense Program)
Semester(s) in which the module is taught	6 th semester
Person responsible for the module (lecturers)	❖ Dr. Andi Tenri Famauri Rifai, SH.,MH. ❖ Abdullah Sanusi, SE.,MEA., Ph.D.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Project-Based Learning (PjBL); Problem-Based Learning (PBL); Entrepreneurial Simulation; Collaborative Learning; Field Study
Workload	❖ Minimal Activity: $4 \times 170 \times 16 = 10,880$ minutes (181.33 hrs) ❖ Maximal Activity: $20 \times 170 \times 16 = 54,400$ minutes (906.67 hrs)
Credit points	1 - 20 credit points equal to 1.62 - 32.38 ECTS (adjusted to activity hours)
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	In terms of knowledge: ❖ Developing students' critical thinking and intellectual quality with integrity and a national outlook, as well as the ability to contribute to the nation's interests and progress. ❖ Actualizing the values of national defense to foster attitudes and behaviors that support the national defense system. ❖ Shaping students with patriotic character, national and state awareness, firm belief in Pancasila as the state ideology, and possessing basic national defense capabilities — both physically (posture, health, and physical readiness) and mentally (mindset and awareness of their rights and obligations in defending the nation).
Content	1. Briefing Materials: 2. Elements of National Defense: a) Love for the homeland; b) Awareness of national and state identity; c) Belief in Pancasila as the state ideology;



	d) Willingness to sacrifice for the nation and the state; and e) Possession of basic national defense capabilities. 3. Student leadership training. 4. Military, civic, or national insight training. 5. Food security and sovereignty training. 6. Education on norms, ethics, character building, and/or soft skills. 7. Anti-corruption education or movement. 8. Anti-drug abuse (NAPZA) education or movement. 9. Anti-radicalism education or movement. 10. Campaigns on the prevention of sexual violence and bullying. 11. Healthy campus and/or green campus campaigns.
Examination form	Portofolio, Activity Log-Book, and Certificate
Study and examination requirements	Students are required to complete all learning components of the course through a performance-based assessment system consisting of a Portfolio, Activity Log-Book, and Certificate.
Reading list	1. Guidebook for the Kampus Mengajar Program, Ministry of Education, Culture, Research, and Technology (Kemendikbudristek). 2. Guidelines for the Implementation of National Defense (Bela Negara) in Higher Education Institutions.
Date of last amendment	August 2024



Maritime Continent Welfare (Independent Project)

Module designation	Maritime Continent Welfare (Independent Project)
Semester(s) in which the module is taught	6 th semester
Person responsible for the module (lecturers)	❖ Dr. Ir. Samsuddin, MT. ❖ Dr. Eng. Ir. Muhammad Niswar, S.T., M.InfoTech
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Project-Based Learning (PjBL); Problem-Based Learning (PBL); Entrepreneurial Simulation; Collaborative Learning; Field Study
Workload	Activity: $20 \times 170 \times 16 = 54,400$ minutes (906.67 hrs)
Credit points	1 - 20 credit points equal to 1.62 - 32.38 ECTS (adjusted to activity hours)
Required and recommended prerequisites for joining the module	None
Module objectives/ Intended Learning Outcomes (ILO)	In terms of knowledge: Able to explain the concept and scope of the Independent Project based on the Welfare of the Maritime Continent, which focuses on the application of technology or scientific work that meets the criteria for competition.
Content	1. Insights into the Welfare of the Indonesian Maritime Continent (BMI). 2. Independent Projects Based on BMI Welfare. 3. General Training (Basic Preparation). 4. Specific Training (Project-Oriented Skills). 5. Field Observation and Data Collection. 6. Initial Seminar (Program Proposal Presentation). 7. Program Implementation. 8. Evaluation Seminar (Mid-term Progress Review). 9. Final Seminar (Results Presentation). 10. Project Reporting and Documentation.
Examination form	Portofolio, Activity Log-Book, and Certificate
Study and examination requirements	Students are required to complete all learning components of the course through a performance-based assessment system consisting of a Portfolio, Activity Log-Book, and Certificate.
Reading list	1. Directorate General of Higher Education, Ministry of Education and Culture. (2020). Independent Learning –



	Independent Campus (Merdeka Belajar Kampus Merdeka) Handbook. 2. Rector Regulation No. 5 of 2020 on Independent Learning – Independent Campus (Merdeka Belajar Kampus Merdeka). 3. Shahab, K. (2017). Rural Sociology. Yogyakarta: Ar-Ruzz Media. ISBN 979-25-4432-1. 4. Rahardjo. (2017). Introduction to Rural and Agricultural Sociology. Yogyakarta: Gadjah Mada University Press. ISBN 978-979-420-555-6. 5. Supriatna, T. (2000). Development Strategy and Poverty. Jakarta: Rineka Cipta. ISBN 979-518-805-4. 4. Burhanuddin. (2020). The Footsteps of Building the Indonesian Maritime Continent: History, Achievements, and Aspirations. Makassar: Faculty of Marine Science and Fisheries, Hasanuddin University. ISBN 978-623-02-2128-6.
Date of last amendment	August 2024



Module Description Research Proposal Seminar

Module designation	Research Proposal Seminar
Module code	23G03140101
Semester(s) in which the module is taught	7 th semester
Person responsible for the module (lecturers)	❖ A.Hermina Julyaningsih, S.TP. , M.Si. ❖ Dr. Fitri, S.TP. ❖ Sunrixon Carmando Yuansah, S.TP. , M.T.P
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Face-to-face lectures and independent learning
Workload	Total workload (estimated): ❖ 45 activity hours
Credit points	1 credit point = 1.62 ECTS
Required and recommended prerequisites for joining the module	Research Methodology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 2. Demonstrates a comprehensive understanding of theoretical concepts and technological literacy related to food science and technology principles and food law to support professional expertise in food science and technology ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards ILO 4. Demonstrates the ability to make strategic decisions in food science and technology based on scientific data analysis and big data interpretation ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management CLO 1. Students are able to prepare a research proposal in accordance with the thesis writing format. CLO 2. Students are able to present a research proposal in a student seminar forum.
Content	❖ Conducting literature review and selecting a research design



	❖ Preparing a research proposal, including Background, Literature Review, and Research Methodology ❖ Ethics in research proposal writing ❖ Strategies for writing a research proposal ❖ Presenting a research proposal
Examination form	Individual research project
Study and examination requirements	To successfully pass the module, students must have a research topic approved by their supervisor. Afterward, their work will be evaluated by examiners.
Reading list	Universitas Hasanuddin. (2023). Guidelines for Writing Student Final Projects at Universitas Hasanuddin. Makassar: Universitas Hasanuddin.
Date of last amendment	10 August 2025



Module Description Research Result Seminar

Module designation	Research Result Seminar
Module code	23G03140201
Semester(s) in which the module is taught	7 th semester
Person responsible for the module (lecturers)	❖ A.Hermina Julyaningsih, S.TP. , M.Si. ❖ Dr. Fitri, S.TP. ❖ Sunrixon Carmando Yuansah, S.TP. , M.T.P
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Face-to-face lectures and independent learning
Workload	Total workload (estimated): ❖ 45 activity hours
Credit points	1 credit point = 1.62 ECTS
Required and recommended prerequisites for joining the module	Research Methodology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 2. Demonstrates a comprehensive understanding of theoretical concepts and technological literacy related to food science and technology principles and food law to support professional expertise in food science and technology ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards ILO 4. Demonstrates the ability to make strategic decisions in food science and technology based on scientific data analysis and big data interpretation ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management CLO 1. Students are able to conduct research according to the planned research methodology. CLO 2. Students are able to prepare a thesis in accordance with the applicable writing format. CLO 3. Students are able to present their research results in a student seminar forum.



Content	Preparing final project
Examination form	Individual Research Project
Study and examination requirements	To successfully pass the module, students must have a research results approved by their supervisor. Afterward, their work will be evaluated by two examiners.
Reading list	Universitas Hasanuddin. (2023). Guidelines for Writing Student Final Projects at Universitas Hasanuddin. Makassar: Universitas Hasanuddin.
Date of last amendment	10 August 2025



Module Description Thesis/ Final Project

Module designation	Thesis/ Final Project
Module code	23G03140306
Semester(s) in which the module is taught	7 th or 8 th semester
Person responsible for the module (lecturers)	Prof. Andi Dirpan, S.TP. , M.Si. , Ph.D.
Language	Indonesian language
Relation to curriculum	Compulsory course
Teaching methods	Face-to-face lectures and independent learning
Workload	Total workload (estimated): ❖ 272 activity hours
Credit points	6 credit point = 9.71 ECTS
Required and recommended prerequisites for joining the module	Research Methodology
Module objectives/ Intended Learning Outcomes (ILO)	ILO 2. Demonstrates a comprehensive understanding of theoretical concepts and technological literacy related to food science and technology principles and food law to support professional expertise in food science and technology ILO 3. Demonstrates effective communication of scientific knowledge both verbally and in written form, adhering to academic and professional standards ILO 4. Demonstrates the ability to make strategic decisions in food science and technology based on scientific data analysis and big data interpretation ILO 5. Applies the principles of food science and technology, statistics, and computer science to implement good manufacturing practices in food industry management CLO 1. Students are able to present their completed thesis in front of the supervisor and examiners. CLO 2. Students are able to present their completed thesis in front of the supervisor and examiners.
Content	Writing final project
Examination form	Individual Research Project



Study and examination requirements	To successfully pass the module, students must have a research results approved by their supervisor. Afterward, their work will be evaluated by two examiners in final thesis defences.
Reading list	Universitas Hasanuddin. (2023). Guidelines for Writing Student Final Projects at Universitas Hasanuddin. Makassar: Universitas Hasanuddin.
Date of last amendment	10 August 2025