

**RENCANA PROGRAM DAN KEGIATAN
PEMBELAJARAN SEMESTER (RPKPS)
COURSE SYLLABUS
SEMESTER GANJIL / GENAP (*ODD/EVEN*)
2026/2027**



Master in Food Science and Technology
Department of Food and Agricultural Products Technology

Teknologi Pangan Terkini

Emerging Food Technology

TPTP265104 (2 SKS)

Dosen Pengampu (*Lecturers*):

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**UNIVERSITAS GADJAH MADA
FACULTY OF AGRICULTURAL TECHNOLOGY
2026**

	Universitas Gadjah Mada Faculty of Agricultural Technology Department of Food and Agricultural Products Technology Master in Food Science and Technology Odd Semester 2026/2027				Kode Dokumen (Document code):	
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RENCANA PROGRAM DAN KEGIATAN PEMBELAJARAN SEMESTER (RPKPS) (COURSE SYLLABUS)						
Kode Mata Kuliah (Course Number)	Nama Mata Kuliah (Course Title)	Bobot (Credits)		Semester (Semester)	Status Mata Kuliah (Course Status)	Mata Kuliah Prasyarat (Prerequisite Courses)
TPTP265104	Teknologi Pangan Terkini (Emerging Food Technology)	T: 2	P: -	Gasal/Genap (Odd/Even)	Wajib (Mandatory)	-
Deskripsi Singkat Mata Kuliah (Short Course Description)	Mata kuliah Teknologi Pangan Lanjut membahas prinsip, aplikasi, dan perkembangan teknologi pengolahan pangan terkini dengan beban kerja mahasiswa setara 2 SKS. Pembelajaran mencakup mekanisme kerja teknologi, pengaruh teknologi pengolahan terhadap keamanan, mutu, stabilitas, dan karakteristik produk pangan, serta evaluasi keunggulan, keterbatasan, dan kesiapan penerapannya dari skala laboratorium menuju skala pilot maupun industri. Mata kuliah ini menerapkan pendekatan case-based learning melalui analisis artikel ilmiah mutakhir dan studi kasus aplikasi industri untuk menghubungkan prinsip teknologi dengan praktik pengolahan pangan modern, sehingga mahasiswa mampu mengevaluasi relevansi teknologi pangan mutakhir dalam menjawab kebutuhan industri pangan yang efisien, inovatif, aman, dan berkelanjutan. Dengan demikian, capaian pembelajaran mata kuliah ini turut mendukung SDG 9 (Industri, Inovasi, dan Infrastruktur) dan SDG 12 (Konsumsi dan Produksi yang Bertanggung Jawab). (Emerging Food Technology explores the principles, applications, and development of emerging food technologies with a student workload equivalent to 2 credits. The course covers the mechanisms of these technologies, their impacts on food safety, quality, stability, and product characteristics, as well as the evaluation of their advantages, limitations, and readiness for implementation from laboratory scale to pilot and industrial scales. This course applies a case-based learning approach through the analysis of recent scientific articles and industrial application case studies to connect technological principles with modern food processing practices. Through this approach, students are able to evaluate the relevance of emerging food technologies in addressing the needs of the food industry for efficient, innovative, safe, and sustainable food processing systems. The learning outcomes of this course contribute to the achievement of SDG 9 (Industry, Innovation, and Infrastructure) and SDG 12 (Responsible Consumption and Production).)					
Capaian Pembelajaran Lulusan yang Dibebankan pada MK	CPL P1 (PLO P1)	Menguasai konsep teoritis dalam bidang spesifik ilmu dan teknologi pangan serta memahami perkembangan mutakhir di bidang tersebut. (Mastering theoretical concepts in specific areas of food science and technology and understand its recent advances.)				

(Program Learning Outcomes (PLO) Assigned to the Course)	CPL KK1 (PLO KK1)	Mampu merancang dan mengembangkan inovasi produk, proses, atau sistem pangan berbasis teknologi pangan mutakhir yang bernilai tambah, aman, bermutu, dan berpotensi hilirisasi. (Able to design and develop innovative food products, processes, or systems using emerging food technologies to create added value, ensure safety and quality, and potential for commercialization.)		
Capaian Pembelajaran Mata Kuliah (CPMK) (Course Learning Outcomes (CLO))	Setelah menyelesaikan pembelajaran mata kuliah ini, mahasiswa diharapkan mampu: (After completing this course, students are expected to be able to:)			
	CPMK P1.1 (CLO P1.1)	Menguasai konsep teoretis pada bidang spesifik ilmu dan teknologi pangan (kimia pangan/bioteknologi pangan/rekayasa proses pangan/pangan gizi/pengelolaan limbah pangan). [CPL P1] (Mastering theoretical concepts in specific areas of food science and technology (food chemistry/food microbiology/food process engineering/food nutrition)) [PLO P1]		
	CPMK P1.2 (CLO P1.2)	Memahami perkembangan terkini dalam ilmu dan teknologi pangan melalui publikasi ilmiah terbaru. [CPL P1] (Understand the current development in food science and technology from recent scientific publications) [PLO P1]		
	CPMK KK1.2 (CLO KK1.2)	Mampu menganalisis dan memecahkan permasalahan kompleks di bidang ilmu dan teknologi pangan dengan pendekatan ilmiah, teknologi dan sistem mutakhir. [CPL KK1] (Able to analyze and solve complex problems in the field of food science and technology using scientific approaches and advanced technologies and systems.) [PLO KK1]		
	CPMK KK1.3 (CLO KK1.3)	Mampu menerapkan prinsip keberlanjutan dalam pengembangan ilmu dan teknologi pangan, termasuk efisiensi proses, pemanfaatan sumber daya, dan pengurangan dampak lingkungan. [CPL KK1] (Able to apply sustainability principles in the development of food science and technology, including process efficiency, resource utilization, and reduction of environmental impacts.) [PLO KK1]		
Kaitan CPMK dengan Materi dan Bentuk Pembelajaran, serta Alokasi Waktu (CLO Relation to Learning Material, Learning Forms, and Time Allocation)		Materi Pembelajaran (Learning Materials)	Bentuk Pembelajaran (Forms of Learning)	Alokasi Waktu (Time Allocation)
	CPMK P1.1 (CLO P1.1) CPMK P1.2 (CLO P1.2)	1. Teknologi-teknologi mutakhir di bidang pangan, misalnya (tidak terbatas pada): (Emerging food technologies, including but not limited to:) - High pressure processing - Pulsed electric field - Ohmic heating - Advanced extraction and packaging technologies	- Kuliah (Lecture) - Diskusi Interaktif (Interactive Discussion)	7 pertemuan 7 meeting Masing-masing terdiri dari: Each meeting consists of: 2x50 menit sinkronus

				(2x50 minutes synchronous) 2x60 menit penugasan terstruktur (2x60 minutes of structured assignments) 2x60 kegiatan mandiri (2x60 minutes of independent study)
		Ujian Tengah Semester / Hasil Tugas Proyek / Studi Kasus Midterm Exam/Project Results/Case Study Results		
	CPMK KK1.2 (CLO KK1.2) CPMK KK1.3 (CLO KK1.3)	2. Presentasi Mahasiswa terkait Topik Pemanfaatan dan Pengembangan Teknologi Pangan Mutakhir, evaluasi terhadap: kelemahan dan kelebihan teknologi, potensi penerapannya pada skala industri, aspek keberlanjutan (sustainability) dalam mendukung <i>green technology</i>. (Student presentations on topics related to the utilization and development of emerging food technologies, including evaluations of the advantages and limitations of the technologies, their potential applications at the industrial scale, and sustainability aspects in supporting green technologies.)	- Presentasi (Presentation) - Diskusi Interaktif (Interactive Discussion)	7 pertemuan 7 meeting Masing-masing terdiri dari: Each meeting consists of: 2x50 menit sinkronus (2x50 minutes synchronous) 2x60 menit penugasan terstruktur (2x60 minutes of structured assignments) 2x60 kegiatan mandiri (2x60 minutes of independent study)
		Ujian Akhir Semester / Hasil Tugas Proyek / Studi Kasus Final Exam/Project Results/Case Study Results		
Metode Pembelajaran (Learning Methods)	Pembelajaran dilaksanakan melalui pembelajaran berbasis masalah atau kasus (problem/case-based learning), tanya jawab, dan diskusi interaktif. Kegiatan pembelajaran menekankan kemampuan berpikir kritis dalam menelaah literatur ilmiah, merumuskan permasalahan penelitian, merancang penelitian eksperimental dan non-eksperimental, serta menyusun justifikasi analisis statistik. Pemanfaatan AI dilakukan secara terbimbing dengan tetap menjunjung tinggi etika dan penalaran ilmiah.			

	<i>(Learning is conducted through problem or case-based learning, Q&A, and interactive discussions. Learning activities emphasize critical thinking in reviewing scientific literature, formulating research problems, designing experimental and non-experimental research, and justifying statistical analysis. The use of AI is carried out in a guided manner while upholding ethics and scientific reasoning.)</i>
Beban kerja <i>(Workload)</i>	Total workload per semester adalah 96 jam, yang terdiri atas 120 menit per minggu untuk kegiatan perkuliahan, 120 menit per minggu untuk tugas terstruktur, dan 120 menit per minggu untuk belajar mandiri, dengan total 16 minggu termasuk UTS dan UAS. <i>(The total workload is approximately 96 hours per semester, consisting of 120 minutes of lectures per week, 120 minutes of structured assignments per week, and 120 minutes of self-study per week, for a total of 16 weeks, including mid-term and final examinations.)</i> Perhitungan Workload per Semester <i>(Workload calculation for one semester)</i> = 6 jam/minggu × 16 minggu/semester = 96 jam/semester = 96 jam/semester ÷ 26 jam/ECTS = 3,7 ECTS/semester <i>= 6 hours/week × 16 weeks/semester = 96 hours/semester = 96 hours/semester ÷ 26 hours/ECTS = 3.7 ECTS/semester</i> Total Workload = 3,7 ECTS/semester Catatan <i>(Notes)</i>: 1 ECTS setara dengan 25–30 jam workload mahasiswa, dengan 26 jam ditetapkan sebagai standar minimum. <i>(1 ECTS is equivalent to 25-30 hours of work, with 26 hours set as the minimum standard.)</i>
Pengalaman Belajar Mahasiswa <i>(Students Activities)</i>	Sesi Sinkron <i>(During Synchronous Sessions):</i> - Berpartisipasi aktif dalam diskusi terkait materi pembelajaran dan studi kasus. <i>Actively engage in discussions on material and case studies.</i> Sesi Asinkron/Mandiri/Penugasan Terstruktur <i>(During Asynchronous/Self-Study/Structured Assignments):</i> - Belajar kelompok <i>Group study</i> - Menyelesaikan kuis-kuis <i>Completing quizzes</i> - Refleksi terhadap materi pembelajaran <i>Reflecting on material</i> - Menelaah literatur serta isu-isu sosial kemasyarakatan <i>Reviewing literature and societal issues</i> - Mengembangkan gagasan proyek multidisipliner <i>Working on multidisciplinary project ideas</i>

Akses Media Pembelajaran/ LMS dan Persentase Luring & Daring (Learning Media Access/LMS and Offline & Online Percentage)	https://simaster.ugm.ac.id/ Luring (Offline): 100% Daring (Online): 0%							
Metode Penilaian dan Keselarasan dengan CPMK (Assessment Method for Each Course Learning Outcomes)	Basis Evaluasi (Evaluation Basis)	Komponen Evaluasi (Evaluation Component)	Bobot (Percentage)	CPMK (CLO)				
				P1.1	P1.2	KK1.2	KK1.4	
	• Aktivitas Partisipatif*) Participatory Activities	Penugasan Assignments						
	• Hasil Project/Hasil Studi Kasus/ Hasil PBL*) Project Results/Case Study Results/PBL Results	Presentasi Presentation	30%	v	v	v	v	
	• Kognitif Cognitive	Skill-based Assessment (SBA)						
Kuis Quiz								
UTS Midterm Exam		35%	v	v	v	v		
UAS Final Exam		35%	v	v	v	v		
	Total	100%						
Daftar Referensi (Reference)	Advanced Technology in Food Processing: - Sun, D. W., 2015, <i>Emerging Technologies for Food Processing</i>, Academic Press - Tiwari, B. K., Bhavya, M. L., 2024, <i>Chemistry of Thermal and Non-Thermal Food Processing Technologies</i>, Academic Press - Knoerzer, K., Muthukumarappan, K., 2021, <i>Innovative Food Processing Technologies</i>, Academic Press High Pressure Processing: - Balasubramaniam, V. M., Barbosa-Cánovas, G. V., Lelieveld, H. L. M., 2016, <i>High Pressure Processing of Food - Principles, Technology and Applications</i>, Springer Cold Plasma: - Misra, N. N., Schlüter, O., Cullen, P. J., 2016, <i>Cold Plasma in Food and Agriculture - Fundamentals and Applications</i>, Academic Press Pulsed Electric Field: - Barbosa-Canovas, G. V., Zhang Q. H., 2019, <i>Pulsed Electric Fields in Food Processing - Fundamental Aspects and Applications</i>, CRC Press							

	Ohmic Heating: Ramaswamy, H. S., Marcotte, M., Sastry, S., Abdelrahim, K., 2014, <i>Ohmic Heating in Food Processing</i>, CRC Press			
Nama Dosen Pengampu <i>(Teaching Team)</i>	1. Dr. Qurrotul A'yun, S.T.P., M.Sc. 2. Prof. Dr. Ir. Supriyadi, M.Sc. 3. Dr. Rini Yanti, S.T.P., M.Sc. 4. Dr. Inasanti Pandan Wangi, S.T.			
Otorisasi <i>(Authorization)</i>	Tanggal Penyusunan <i>(Date)</i>	Koordinator Mata Kuliah <i>(Course Coordinator)</i>	Koordinator Bidang Keahlian (Jika Ada) <i>(Head of Curriculum (if available))</i>	Ketua Program Studi <i>(Head of the Study Program)</i>
	30 Juni 2026	 Dr. Qurrotul A'yun, S.T.P., M.Sc.	-	Dr. Widiastuti Setyaningsih, S.T.P., M.Sc