	Universitas Negeri Surabaya S1 Fisika	Kode Dokumen

RENCANA PEMBELAJARAN SEMESTER

MATA KULIAH (MK)	KODE	Rumpun MK	BOBOT (sks)	SEMESTER	Tgl Penyusunan
Fisika Atmosfer	4520102248		2		20 September 2026

OTORISASI	Pengembang RPS	Koordinator RMK	Koordinator Program Studi
	Prof. Dr. Madlazim, M.Si.	Arie Realita, M.Si.	MUNASIR

Deskripsi Singkat MK	Atmospheric Physics discusses problems in physics that are sourced from levels of knowledge and uses of atmospheric resources in Indonesia. Learning strategy in this course involves the introduction of atmospheric sciences through phenomenological approaches with emphasizes are placed on physical aspects. Class discussions include examination of a layered structure of the atmosphere and corresponding characteristics of each layer, atmospheric overturning circulation at low- and mid-latitudes (the Hadley Cell), planetary waves and associated transform of energy, ionospheric currents, air-sea interaction (El-Nino and La-Nina cases), hydrometeorological hazards (extreme weather, excessive rainfalls, floods, droughts, forest fires, atmospheric storms) related to a coupled physical system of the ocean and atmosphere, the crucial roles of the atmosphere in weather and climate systems at local, regional and global scales, climate change and global warming.	
Capaian Pembelajaran (CP)	**CPL-PRODI yang dibebankan pada MK**	
	CPL-3	Mengembangkan pemikiran logis, kritis, sistematis, dan kreatif dalam melakukan pekerjaan yang spesifik di bidang keahliannya serta sesuai dengan standar kompetensi kerja bidang yang bersangkutan
	CPL-7	Mampu menganalisis dan menerapkan prinsip-prinsip fisika dalam memahami, memanfaatkan, serta mengevaluasi teknologi yang relevan dan aplikasinya.
	CPL-8	Mampu mengomunikasikan gagasan, argumen ilmiah, dan hasil penelitian secara efektif, baik secara tertulis maupun lisan, dalam konteks akademik dan profesional.
	Capaian Pembelajaran Mata Kuliah (CPMK)	
	CPMK-1	Understanding a systematic study of the atmosphere as a physical system and its roles in human life and living organisms.
	CPMK-2	Understanding stably stratified layers of the atmosphere and the corresponding characteristics of each layer.
	CPMK-3	Understanding interdependence of human and the atmosphere.
	CPMK-4	Understanding the dynamics of the atmosphere associated with overturning circulation and transform of energy in the atmosphere.
	CPMK-5	Understanding potential threats from hydrometeorological hazards associated with a coupled system of the ocean and atmosphere.
	Matrik CPL - CPMK	

CPMK	CPL-3	CPL-7	CPL-8
CPMK-1	✔		
CPMK-2	✔		
CPMK-3		✔	
CPMK-4			✔
CPMK-5			✔

Matrik CPMK pada Kemampuan akhir tiap tahapan belajar (Sub-CPMK)

CPMK	Minggu Ke														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CPMK-1	✔							✔								✔
CPMK-2			✔	✔												
CPMK-3		✔														
CPMK-4					✔	✔	✔		✔							
CPMK-5										✔	✔	✔	✔	✔	✔	

Pustaka

Utama :

1. Vallis, G. K. 2006. Atmospheric and Oceanic Fluid Dynamics. Cambridge, UK: Cambridge University Press, pp.1-745.
2. Ahrens, C. D. 2011. Essentials of Meteorology: An Invitation to the Atmosphere. Melbourne, Australia: Cengage Learning, pp.1-526.
3. Lambeck, K. 2010. The Science of Climate Change: Questions and Answers. Canberra, Australia: Australian Academy of Science. pp.1-24.
4. Hare, S., Cresswell, L., Twigg, and Buchdahl, R. 2002. Air Pollution. Manchester, UK: Atmosphere, Climate and Environment (ACE) Information Programme, Manchester Metropolitan Uni. pp.1-153.
5. Cushman-Roisin, B. and Beckers, J-M. 2009. Introduction to Geophysical Fluid Dynamics. New Hampshire, US: Academic Press, pp.1-759.

Pendukung :

1. Some power point files and/or course materials relevant to Atmospheric Physics from the internet

Mg Ke-	Kemampuan akhir tiap tahapan belajar (Sub-CPMK)	Penilaian		Bentuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu]		Materi Pembelajaran	Bobot Penilaian (%)
		Indikator	Kriteria & Bentuk	Luring (*offline*)	*Daring (online)*		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Being able to understand the atmosphere as a physical system with crucial roles in life	Students can explain the atmosphere as a physical system with crucial roles in life.	Menyelesaikan tugas dengan tepat waktu	Contextual Learning Class discussion Q & A			2%
2	Being able to understand interdependence of human on the dynamics of the atmosphere	Students can explain interdependence of human on the dynamics of the atmosphere.	Menyelesaikan tugas dengan tepat waktu	Contextual Learning Class discussion Q & A			2%
3	Being able to understand basic features of the atmosphere, a layered structure of its own physical characteristics in each layer	Students can explain basic features of the atmosphere, a layered structure of its own physical characteristics in each layer.	Menyelesaikan tugas dengan tepat waktu	Contextual Learning Class discussion Q & A			2%

4	Being able to understand basic features of the atmosphere, a layered structure of its own physical characteristics in each layer	Students can explain basic features of the atmosphere, a layered structure of its own physical characteristics in each layer.	Menyelesaikan tugas dengan tepat waktu	Contextual Learning Class discussion Q & A			5%
5	Being able to understand meridional circulation in the atmosphere, the corresponding Hadley Cell and atmospheric parameters	Students can explain meridional circulation in the atmosphere, the corresponding Hadley Cell and atmospheric parameters.	Menyelesaikan tugas dengan tepat waktu	Contextual Learning Class discussion Q & A			2%
6	Being able to understand meridional circulation in the atmosphere, the corresponding Hadley Cell and atmospheric parameters	Students can explain meridional circulation in the atmosphere, the corresponding Hadley Cell and atmospheric parameters.	Menyelesaikan tugas dengan tepat waktu	Contextual Learning Class discussion Q & A			5%
7	Being able to understand mid- and low-latitudes atmospheric circulation in terms of zonally-averaged atmospheric circulation	Students can explain mid- and low-latitudes atmospheric circulation in terms of zonally-averaged atmospheric circulation.	kriteria penilaian tersedia	Contextual Learning Class discussion Q & A			2%
8	Mid Semester Exam	Mid Semester Exam		Mid Semester Exam			20%
9	Being able to understand planetary waves in the atmosphere, propagation and interaction of Rossby and Kelvin waves	Students can explain planetary waves in the atmosphere, propagation and interaction of Rossby and Kelvin waves.	Menyelesaikan tugas dengan tepat waktu	Contextual Learning Class discussion Q & A			2%
10	Being able to understand effects of air-sea interaction with respect to wind-forcing pattern on atmospheric conditions at local, regional and global scales	Students can explain effects of air-sea interaction with respect to wind-forcing pattern on atmospheric conditions at local, regional and global scales.	Menyelesaikan tugas dengan tepat waktu	Contextual Learning Class discussion Q & A			2%
11	Being able to understand effects of air-sea interaction with respect to wind-forcing pattern on atmospheric conditions at local, regional and global scales	Students can explain effects of air-sea interaction with respect to wind-forcing pattern on atmospheric conditions at local, regional and global scales.	Menyelesaikan tugas dengan tepat waktu	Contextual Learning Class discussion Q & A			2%

12	Being able to understand potential threats from atmospheric hazards associated with a coupled system of ocean hydrological cycle and atmospheric dynamics	Students can explain potential threats from atmospheric hazards associated with a coupled system of ocean hydrological cycle and atmospheric dynamics.	Menyelesaikan tugas dengan tepat waktu	Contextual Learning Class discussion Q & A			2%
13	Being able to understand potential threats from atmospheric hazards associated with a coupled system of ocean hydrological cycle and atmospheric dynamics	Students can explain potential threats from atmospheric hazards associated with a coupled system of ocean hydrological cycle and atmospheric dynamics.	Menyelesaikan tugas dengan tepat waktu	Contextual Learning Class discussion Q & A			2%
14	Being able to understand posters relevant to atmospheric physics with emphasis upon the crucial roles of the atmosphere in weather and climate systems at local, regional and global scales	Students can explain posters relevant to atmospheric physics with emphasis upon the crucial roles of the atmosphere in weather and climate systems at local, regional and global scales.	Menyelesaikan tugas dengan tepat waktu	Poster Presentation for Project-Based Learning Discussion Q & A			10%
15	Being able to understand posters relevant to atmospheric physics with emphasis upon the crucial roles of the atmosphere in weather and climate systems at local, regional and global scales	Students can explain posters relevant to atmospheric physics with emphasis upon the crucial roles of the atmosphere in weather and climate systems at local, regional and global scales.	Menyelesaikan tugas dengan tepat waktu	Poster Presentation for Project-Based Learning Discussion Q & A			10%
16	Final Exam	Final Exam	Menyelesaikan tugas dengan tepat waktu	Final Exam			30%

SDGS (Sustainable Development Goals)



Catatan

1. **Capaian Pembelajaran Lulusan Program Studi (CPL-Prodi)** adalah rumusan kemampuan yang harus dimiliki oleh lulusan program studi yang mencakup sikap, penguasaan pengetahuan, keterampilan umum, dan keterampilan khusus sesuai dengan jenjang kualifikasi, yang diperoleh melalui proses pembelajaran.
2. **CPL-Prodi yang dibebankan pada Mata Kuliah** adalah bagian dari CPL-Prodi yang dipilih dan relevan untuk dikembangkan melalui suatu mata kuliah, sebagai dasar perumusan capaian pembelajaran mata kuliah.

3. **Capaian Pembelajaran Mata Kuliah (CPMK)** adalah kemampuan yang dirumuskan secara spesifik dan diturunkan dari CPL-Prodi yang dibebankan pada mata kuliah, serta menggambarkan kompetensi yang harus dicapai mahasiswa setelah menyelesaikan mata kuliah.
4. **Sub-CPMK** adalah kemampuan akhir yang direncanakan pada setiap tahap pembelajaran, sebagai penjabaran lebih rinci dari CPMK, bersifat terukur dan dapat diamati sesuai dengan materi pembelajaran.
5. **Indikator Penilaian** adalah pernyataan spesifik dan terukur yang digunakan untuk menilai ketercapaian Sub-CPMK, baik dari proses maupun hasil belajar mahasiswa, yang didukung dengan bukti penilaian.
6. **Kriteria Penilaian** adalah tolok ukur yang digunakan untuk menentukan tingkat ketercapaian hasil belajar mahasiswa berdasarkan indikator penilaian, guna menjamin penilaian yang objektif, konsisten, dan adil. Kriteria penilaian dapat bersifat kuantitatif dan/atau kualitatif.
7. **Bentuk Penilaian** meliputi penilaian tes dan non-tes sesuai dengan karakteristik capaian pembelajaran.
8. **Bentuk Pembelajaran** meliputi kuliah, responsi, tutorial, seminar atau bentuk lain yang setara, praktikum, praktik studio, praktik bengkel, praktik lapangan, penelitian, dan pengabdian kepada masyarakat.
9. **Metode Pembelajaran** merupakan cara penyampaian pembelajaran yang digunakan untuk mencapai capaian pembelajaran, antara lain Small Group Discussion, Project Based Learning, Case Based Learning, Collaborative Learning, Discovery Learning, Self-Directed Learning, serta metode lain yang relevan.
10. **Materi Pembelajaran** adalah bahan kajian yang disusun secara sistematis dalam bentuk pokok dan sub-pokok bahasan untuk mendukung pencapaian Sub-CPMK.
11. **Bobot Penilaian** adalah persentase kontribusi setiap komponen penilaian terhadap nilai akhir mata kuliah, yang ditetapkan secara proporsional sesuai tingkat kompleksitas dan ketercapaian Sub-CPMK, dengan total keseluruhan sebesar 100%.
12. TM = Tatap Muka, PT = Penugasan Terstruktur, BM = Belajar Mandiri.