



**Universitas Negeri Surabaya**  
**Fakultas Matematika dan Ilmu Pengetahuan Alam**  
**Program Studi S1 Biologi**

Kode Dokumen

### RENCANA PEMBELAJARAN SEMESTER

MATA KULIAH (MK)	KODE	Rumpun MK	BOBOT (sks)	SEMESTER	Tgl Penyusunan
Imunologi*	4620102094	Mata Kuliah Pilihan Program Studi	T=2 P=0 ECTS=3.18	6	2 Desember 2024
OTORISASI	Pengembang RPS		Koordinator RMK		Koordinator Program Studi
	Erlin Rakhmad Purnama, M.Si		Dr. Nur Kuswanti, M.Sc.St		Dr. H. Sunu Kuntjoro, S.Si., M.Si.

<b>Model Pembelajaran</b>	Case Study
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<b>Capaian Pembelajaran (CP)</b>	CPL-PRODI yang dibebankan pada MK
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<b>CPL-7</b>	Mampu merancang dan melakukan eksperimen dalam bidang biologi, mengelola, menganalisis, menafsirkan, mendokumentasikan, dan menyimpan data penelitian, untuk mengelola sumber daya alam hayati
<b>CPL-8</b>	Mampu menerapkan keterampilan yang dapat ditransfer dalam biologi untuk mengembangkan ecopreneurship (eco- innovation, eco- opportunity, eco- comitmen)
<b>CPL-10</b>	Mampu mendemonstrasikan pengetahuan dasar tentang biologi sel dan molekuler, biologi organisme, ekologi dan evolusi untuk menganalisis isu-isu biologi terkini

<b>Capaian Pembelajaran Mata Kuliah (CPMK)</b>	
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<b>CPMK - 1</b>	Mampu menerapkan konsep dasar imunologi dalam merancang eksperimen untuk menguji hipotesis terkait respon imun (C3)
<b>CPMK - 2</b>	Mampu menerapkan prinsip-prinsip imunologi dalam mengembangkan inovasi ecopreneurship yang berfokus pada kesehatan dan keberlanjutan lingkungan (C3)
<b>CPMK - 3</b>	Mampu menganalisis peluang pasar untuk produk bioteknologi yang berbasis imunologi, dengan mempertimbangkan aspek ekologi dan ekonomi (C4)
<b>CPMK - 4</b>	Mampu menganalisis dan menginterpretasi literatur ilmiah terkini dalam imunologi untuk mendukung pemahaman tentang isu-isu biologi terkini (C4)
<b>CPMK - 5</b>	Mampu mengintegrasikan pengetahuan imunologi dengan konsep biologi sel dan molekuler untuk menghasilkan solusi inovatif dalam penelitian biologi (C6)

<b>Matrik CPL - CPMK</b>	
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	CPL-7	CPL-8	CPL-10		
CPMK-1	✓				
CPMK-2	✓				
CPMK-3		✓			
CPMK-4			✓		
CPMK-5				✓	

<b>Matrik CPMK pada Kemampuan akhir tiap tahapan belajar (Sub-CPMK)</b>	
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		Minggu Ke															
	CPMK	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												✓	✓	✓			

<b>Deskripsi Singkat MK</b>	This course discusses the immune system and its components, leukocyte circulation and migration, immune response, antigens and antibodies, lymphoid tissue and immunocompetent cell maturation, immunoglobulin structure and function, immunoglobulin synthesis, Major Histocompatibility Complex (MHC), complement, immunomodulatory and cytokines, monoclonal antibodies, immunity against tropical diseases, viruses, cancer, immunity in the reproductive system, immunodeficiency, autoimmunity, and hypersensitivity reactions. This course is presented through lectures, discussions, and structured assignments.
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<b>Pustaka</b>	<b>Utama :</b>
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		1. Abbas, A.K., Lichtman, A.H., and Pillai, S. 2023. BASIC IMMUNOLOGY: Functions and Disorders of the Immune System, 7 th Edition. Missouri: Elsevier 2. Abbas, A.K., Lichtman, A.H., and Pillai, S. 2018. CELLULAR AND MOLECULAR IMMUNOLOGY, 9th Edition. Philadelphia: Elsevier 3. Delves, P.J., Martin, S.J., Burton, D.R., and Roitt, I.M. 2017. ROITT'S ESSENTIAL IMMUNOLOGY, 13th Edition. London: Wiley Blackwell					
		<b>Pendukung :</b>					
		1. Purnama, E.R. 2021. Modul 1: Imunologi. CV AUSY MEDIA					
<b>Dosen Pengampu</b>		Dr. Nur Kuswanti, M.Sc.St. Nur Qomariyah, S.Pd., M.Sc. Erlis Rakhmad Purnama, S.Si., M.Si.					
Mg Ke-	Kemampuan akhir tiap tahapan belajar (Sub-CPMK)	Penilaian		Bantuan Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu]		Materi Pembelajaran [Pustaka]	Bobot Penilaian (%)
		Indikator	Kriteria & Bentuk	Luring (offline)	Daring (online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Identifying The Basic Concepts of Immune System	1.Explaining the history of immunology 2.Identifying the position of immunology in other sciences 3.Explaining the concept of body's defense system 4.Connecting recent research about immunological concepts	<b>Kriteria:</b> 1. Assignment 30% 2. Mid-Exam 20% 3. Attendance and Participation 20%  <b>Bentuk Penilaian :</b> Aktifitas Partisipasif, Tes	Oration method in classroom 2 X 50 menit	Oration method by paltform Google Classroom 2 x 50 menit	<b>Materi:</b> Identifying The Basic Concepts of Immune System <b>Pustaka:</b> Abbas, A.K., Lichtman, A.H., and Pillai, S. 2023. BASIC IMMUNOLOGY: Functions and Disorders of the Immune System, 7 th Edition. Missouri: Elsevier	5%
2	Describing Immune Response	1.Explaining the humoral immune system and the components 2.Explaining the cellular immune system and the components 3.Explaining initiation of immune response 4.Explaining innate and adapative immune responses	<b>Kriteria:</b> 1. Assignment 30% 2. Mid-Exam 20% 3. Attendance and Participation 20%  <b>Bentuk Penilaian :</b> Aktifitas Partisipasif, Tes	Discussion and Assignment in Classroom 2 X 50 menit	Discussion and Assignment via Google Classroom 2 x 50 menit	<b>Materi:</b> Describing Immune Response <b>Pustaka:</b> Abbas, A.K., Lichtman, A.H., and Pillai, S. 2018. CELLULAR AND MOLECULAR IMMUNOLOGY, 9th Edition. Philadelphia: Elsevier	5%
3	Explaining Lymphoid Tissue and Maturation of Immunocompetent Cells	1. Identifying types of lymphoid tissue and immunocompetent cells 2. Explaining Maturation of immunocompetent cells	<b>Kriteria:</b> 1. Assignment 30% 2. Mid-Exam 20% 3. Attendance and Participation 20%  <b>Bentuk Penilaian :</b> Aktifitas Partisipasif, Tes	Oration and discussion in Classroom 2 X 50 menit	Oration and discussion via Google Classroom or Meet 2 x 50 menit	<b>Materi:</b> Explaining Lymphoid Tissue and Maturation of Immunocompetent Cells <b>Pustaka:</b> Abbas, A.K., Lichtman, A.H., and Pillai, S. 2018. CELLULAR AND MOLECULAR IMMUNOLOGY, 9th Edition. Philadelphia: Elsevier	5%
4	Comparing structure, Function and Synthesis of Immunoglobulins	1. Identifying structure of the various classes of immunoglobulins 2. Identifying structure of the various function of immunoglobulins 3. Explaining immunoglobulins synthesis	<b>Kriteria:</b> 1. Assignment 30% 2. Mid-Exam 20% 3. Attendance and Participation 20%  <b>Bentuk Penilaian :</b> Aktifitas Partisipasif, Tes	Oration in Classroom 2 X 50 menit	Oration via Google Meet or discussion via Google Classroom 2 x 50 menit	<b>Materi:</b> Comparing structure, Function and Synthesis of Immunoglobulins <b>Pustaka:</b> Abbas, A.K., Lichtman, A.H., and Pillai, S. 2018. CELLULAR AND MOLECULAR IMMUNOLOGY, 9th Edition. Philadelphia: Elsevier	5%

5	Describing Antigens and Antibodies Reaction Process	<ol style="list-style-type: none"> <li>1. Identifying meanings of antigens and antibodies</li> <li>2. Describing general structure of antibodies</li> <li>3. Explaining the bond between antibodies and antigens.</li> </ol>	<p><b>Kriteria:</b></p> <ol style="list-style-type: none"> <li>1. Assignment 30%</li> <li>2. Mid-Exam 20%</li> <li>3. Attendance and Participation 20%</li> </ol> <p><b>Bentuk Penilaian :</b> Aktifitas Partisipatif, Penilaian Hasil Project / Penilaian Produk, Tes</p>	Oration and Assignment: some cases about Antigens and Antibodies reactions 2 X 50 menit	Discussion and Assignment in case "Research results in monoclonal antibodies from hybridoma cells that bind to specific antigens" 2 x 50 menit	<p><b>Materi:</b> Antigens and Antibodies Reaction Process</p> <p><b>Pustaka:</b> Abbas, A.K., Lichtman, A.H., and Pillai, S. 2023. <i>BASIC IMMUNOLOGY: Functions and Disorders of the Immune System, 7th Edition.</i> Missouri: Elsevier</p>	10%
6	Describing Mechanism Circulation and Migration of Leukocytes	<ol style="list-style-type: none"> <li>1. Describing interaction of leukocytes and endothelial tissue</li> <li>2. Identifying the way of migration of neutrophils and monocytes to the infected site</li> <li>3. Explaining the migration and recirculation pattern of T lymphocytes</li> </ol>	<p><b>Kriteria:</b></p> <ol style="list-style-type: none"> <li>1. Assignment 30%</li> <li>2. Mid-Exam 20%</li> <li>3. Attendance and Participation 20%</li> </ol> <p><b>Bentuk Penilaian :</b> Aktifitas Partisipatif, Tes</p>	Oration and discussion on case studies of immunotherapy strategies based on Leucocytes activity in the Classroom 2 X 50 menit	Online discussion on case studies of immunotherapy strategies based on Leucocytes activity 2 X 50 menit	<p><b>Materi:</b> Circulation and Migration of Leukocytes</p> <p><b>Pustaka:</b> Abbas, A.K., Lichtman, A.H., and Pillai, S. 2018. <i>CELLULAR AND MOLECULAR IMMUNOLOGY, 9th Edition.</i> Philadelphia: Elsevier</p>	5%
7	Comparing Structure and Function of The Various Classes of Major Histocompatibility Complex (MHC)	<ol style="list-style-type: none"> <li>1. Describing meanings of MHC</li> <li>2. Identifying all kinds of MHC</li> <li>3. Explaining role of MHC about immune system concept</li> </ol>	<p><b>Kriteria:</b></p> <ol style="list-style-type: none"> <li>1. Assignment 30%</li> <li>2. Mid-Exam 20%</li> </ol> <p><b>Bentuk Penilaian :</b> Tes</p>	Oration or discussion in the Classroom; Immunology Modul implementation 2 X 50 menit	Immunology Modul implementation 2 X 50 menit	<p><b>Materi:</b> Structure and Function of The Various Classes of Major Histocompatibility Complex (MHC)</p> <p><b>Pustaka:</b> Abbas, A.K., Lichtman, A.H., and Pillai, S. 2023. <i>BASIC IMMUNOLOGY: Functions and Disorders of the Immune System, 7th Edition.</i> Missouri: Elsevier</p> <p><b>Materi:</b> Major Histocompatibility Complex (MHC)</p> <p><b>Pustaka:</b> Purnama, E.R. 2021. <i>Modul 1: Immunologi. CV AUSY MEDIA</i></p>	10%
8	Middel Exam	Meeting 1-7	<p><b>Kriteria:</b> Based on each indicator</p> <p><b>Bentuk Penilaian :</b> Tes</p>	- 2 X 50			5%
9	Explaining The Meaning and Role of Cytokines and Immune System Complement	<ol style="list-style-type: none"> <li>1. Explaining definition of cytokines and complement</li> <li>2. Mentioning the biological function of cytokines and complement</li> </ol>	<p><b>Kriteria:</b></p> <ol style="list-style-type: none"> <li>1. Assignment 30%</li> <li>2. Final Exam 30%</li> <li>3. Attendance and Participation 20%</li> </ol> <p><b>Bentuk Penilaian :</b> Aktifitas Partisipatif, Penilaian Hasil Project / Penilaian Produk</p>	Oration or discussion in Classroom 2 X 50 menit	Discussion about the cytokines experiment as case study 2 x 50 menit	<p><b>Materi:</b> Role of Cytokines and Immune System Complement</p> <p><b>Pustaka:</b> Abbas, A.K., Lichtman, A.H., and Pillai, S. 2023. <i>BASIC IMMUNOLOGY: Functions and Disorders of the Immune System, 7th Edition.</i> Missouri: Elsevier</p>	5%

10	Describing Monoclonal Antibody and Immunomodulatory	<ol style="list-style-type: none"> <li>1.Describing definition of monoclonal antibody</li> <li>2.Identifying process of making monoclonal antibody</li> <li>3.Explaining the role of monoclonal antibody as diagnostic and therapeutic</li> <li>4.Explaining definition of immunomodulator</li> <li>5.Identifying the role of immunomodulatory substances in the body</li> </ol>	<p><b>Kriteria:</b></p> <ol style="list-style-type: none"> <li>1.Assignment 30%</li> <li>2.Final Exam 20%</li> <li>3.Attendance and Participation 20%</li> </ol> <p><b>Bentuk Penilaian :</b> Aktifitas Partisipatif</p>	Oration and discussion in Classroom 2 X 50 menit	Discussion about Monoclonal Antibody as a Case Study 2 X 50 menit	<p><b>Materi:</b> Monoclonal Antibody</p> <p><b>Pustaka:</b> <i>Delves, P.J., Martin, S.J., Burton, D.R., and Roitt, I.M. 2017. ROITT'S ESSENTIAL IMMUNOLOGY, 13th Edition. London: Wiley Blackwell</i></p> <hr/> <p><b>Materi:</b> Immunomodulatory</p> <p><b>Pustaka:</b> <i>Purnama, E.R. 2021. Modul 1: Immunologi. CV AUSY MEDIA</i></p>	5%
11	Analyzing Process of Immunity of Tropical Diseases	<ol style="list-style-type: none"> <li>1.Explaining definition of tropical diseases</li> <li>2.Comparing system immune function on the pathogens (bacteria, fungi, and parasites)</li> </ol>	<p><b>Kriteria:</b></p> <ol style="list-style-type: none"> <li>1.Assignment 30%</li> <li>2.Final Exam 30%</li> <li>3.Attendance and Participation 20%</li> </ol> <p><b>Bentuk Penilaian :</b> Aktifitas Partisipatif</p>	Oration and discussion in Classroom 2 X 50 menit	Discussion in case: Immune Response in Dengue Hemorrhagic Fever and Antibody-Dependent Enhancement 2 X 50 menit	<p><b>Materi:</b> Immune Response in Dengue Hemorrhagic Fever</p> <p><b>Pustaka:</b> <i>Abbas, A.K., Lichtman, A.H., and Pillai, S. 2018. CELLULAR AND MOLECULAR IMMUNOLOGY, 9th Edition. Philadelphia: Elsevier</i></p> <hr/> <p><b>Materi:</b> Antibody-Dependent Enhancement</p> <p><b>Pustaka:</b> <i>Delves, P.J., Martin, S.J., Burton, D.R., and Roitt, I.M. 2017. ROITT'S ESSENTIAL IMMUNOLOGY, 13th Edition. London: Wiley Blackwell</i></p>	5%
12	Describing Immunity of Viruses and Cancer	<ol style="list-style-type: none"> <li>1.Explaining immune system role of viruses and cancer</li> <li>2.Explaining immune response mechanism of viruses and cancer</li> <li>3.Browsing various information on immune therapy of cancer</li> </ol>	<p><b>Kriteria:</b></p> <ol style="list-style-type: none"> <li>1.Assignment 30%</li> <li>2.Attendance and Participation 20%</li> <li>3.Final Exam 30%</li> </ol> <p><b>Bentuk Penilaian :</b> Aktifitas Partisipatif, Tes</p>	Oration and discussion in Classroom 2 X 50 menit	Oration and discussion in Google Meet 2 X 50 menit	<p><b>Materi:</b> Immunity of Viruses and Cancer</p> <p><b>Pustaka:</b> <i>Abbas, A.K., Lichtman, A.H., and Pillai, S. 2023. BASIC IMMUNOLOGY: Functions and Disorders of the Immune System, 7th Edition. Missouri: Elsevier</i></p>	5%
13	Describing Immunology of the Reproductive System	<ol style="list-style-type: none"> <li>1.Explaining immunity on male and female system reproduction</li> <li>2.Explaining immunity in fertilization and pregnancy</li> </ol>	<p><b>Kriteria:</b></p> <ol style="list-style-type: none"> <li>1.Assignment 30%</li> <li>2.Attendance and Participation 20%</li> <li>3.Final Exam 30%</li> </ol> <p><b>Bentuk Penilaian :</b> Aktifitas Partisipatif, Penilaian Hasil Project / Penilaian Produk, Tes</p>	Oration and discussion in Classroom 2 X 50 menit	Discussion about Immunology of the Reproductive System via Google Meet 2 x 50 menit	<p><b>Materi:</b> Immunology of the Reproductive System</p> <p><b>Pustaka:</b> <i>Abbas, A.K., Lichtman, A.H., and Pillai, S. 2023. BASIC IMMUNOLOGY: Functions and Disorders of the Immune System, 7th Edition. Missouri: Elsevier</i></p>	5%

14	Explaining The Concept of Immunodeficiency and Autoimmune	1.Explaining primary and secondary immunodeficiency 2.Explaining HIV and AIDS 3.Explaining definition of autoimmune and types of autoimmune	<b>Kriteria:</b> 1.Assignment 30% 2.Attendance and Participation 20% 3.Final Exam 30%  <b>Bentuk Penilaian :</b> Aktifitas Partisipasif, Penilaian Hasil Project / Penilaian Produk	Oration and discussion in Classroom 2 X 50 menit	Discussion about Immunodeficiency and Autoimmune via Google Meet 2 x 50 menit	<b>Materi:</b> Immunodeficiency and Autoimmune <b>Pustaka:</b> <i>Delves, P.J., Martin, S.J., Burton, D.R., and Roitt, I.M. 2017. ROITT'S ESSENTIAL IMMUNOLOGY, 13th Edition. London: Wiley Blackwell</i>	5%
15	Explaining Concept Hypersensitivity Reaction	1.Explaining the causes of hypersensitivity 2.Explaining mechanism and classification of hypersensitivity reactions 3.Explaining the diseases caused by antibodies and T lymphocytes	<b>Kriteria:</b> 1.Assignment 30% 2.Attendance and Participation 20% 3.Final Exam 30%  <b>Bentuk Penilaian :</b> Aktifitas Partisipasif, Tes	Oration and discussion in Classroom 2 X 50 menit	Discussion about Hypersensitivity Reaction 2 x 50 menit	<b>Materi:</b> Hypersensitivity Reaction <b>Pustaka:</b> <i>Abbas, A.K., Lichtman, A.H., and Pillai, S. 2018. CELLULAR AND MOLECULAR IMMUNOLOGY, 9th Edition. Philadelphia: Elsevier</i>	10%
16		Materi 9 - 15	<b>Kriteria:</b> Final Exam 30%  <b>Bentuk Penilaian :</b> Aktifitas Partisipasif			<b>Materi:</b> All <b>Pustaka:</b> <i>Abbas, A.K., Lichtman, A.H., and Pillai, S. 2023. BASIC IMMUNOLOGY: Functions and Disorders of the Immune System, 7th Edition. Missouri: Elsevier</i>	10%

#### Rekap Persentase Evaluasi : Case Study

No	Evaluasi	Persentase
1.	Aktifitas Partisipasif	50%
2.	Penilaian Hasil Project / Penilaian Produk	10%
3.	Tes	40%
		100%

#### Catatan

- Capaian Pembelajaran Lulusan Prodi (CPL - Prodi)** adalah kemampuan yang dimiliki oleh setiap lulusan prodi yang merupakan internalisasi dari sikap, penguasaan pengetahuan dan ketrampilan sesuai dengan jenjang prodinya yang diperoleh melalui proses pembelajaran.
- CPL yang dibebankan pada mata kuliah** adalah beberapa capaian pembelajaran lulusan program studi (CPL-Prodi) yang digunakan untuk pembentukan/pengembangan sebuah mata kuliah yang terdiri dari aspek sikap, ketrampilan umum, ketrampilan khusus dan pengetahuan.
- CP Mata kuliah (CPMK)** adalah kemampuan yang dijabarkan secara spesifik dari CPL yang dibebankan pada mata kuliah, dan bersifat spesifik terhadap bahan kajian atau materi pembelajaran mata kuliah tersebut.
- Sub-CPMK Mata kuliah (Sub-CPMK)** adalah kemampuan yang dijabarkan secara spesifik dari CPMK yang dapat diukur atau diamati dan merupakan kemampuan akhir yang direncanakan pada tiap tahap pembelajaran, dan bersifat spesifik terhadap materi pembelajaran mata kuliah tersebut.
- Indikator penilaian** kemampuan dalam proses maupun hasil belajar mahasiswa adalah pernyataan spesifik dan terukur yang mengidentifikasi kemampuan atau kinerja hasil belajar mahasiswa yang disertai bukti-bukti.
- Kreteria Penilaian** adalah patokan yang digunakan sebagai ukuran atau tolok ukur ketercapaian pembelajaran dalam penilaian berdasarkan indikator-indikator yang telah ditetapkan. Kreteria penilaian merupakan pedoman bagi penilai agar penilaian konsisten dan tidak bias. Kreteria dapat berupa kuantitatif ataupun kualitatif.
- Bentuk penilaian:** tes dan non-tes.
- Bentuk pembelajaran:** Kuliah, Responsi, Tutorial, Seminar atau yang setara, Praktikum, Praktik Studio, Praktik Bengkel, Praktik Lapangan, Penelitian, Pengabdian Kepada Masyarakat dan/atau bentuk pembelajaran lain yang setara.
- Metode Pembelajaran:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, dan metode lainnya yg setara.
- Materi Pembelajaran** adalah rincian atau uraian dari bahan kajian yg dapat disajikan dalam bentuk beberapa pokok dan sub-pokok bahasan.
- Bobot penilaian** adalah prosentasi penilaian terhadap setiap pencapaian sub-CPMK yang besarnya proposional dengan tingkat kesulitan pencapaian sub-CPMK tsb., dan totalnya 100%.
- TM=Tatap Muka, PT=Penugasan terstruktur, BM=Belajar mandiri.

Koordinator Program Studi S1  
Biologi



Dr. H. Sunu Kuntjoro, S.Si., M.Si.  
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**UPM** Program Studi S1 Biologi



Dr. Ulfi Faizah, S.Pd., M.Si.  
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