

Kode Mata Kuliah	KI5075 / 3 SKS	
Penyelenggara	248 - Pengajaran Kimia / FMIPA	
Kategori	Kuliah	
	Bahasa Indonesia	English
Nama Mata Kuliah	Struktur dan Kereaktifan Molekul Organik	Structure and Reactivity of Organic Molecules
Bahan Kajian	<ol style="list-style-type: none"> 1. Struktur (ikatan kimia, konsep resonansi, konsep asam-basa, gugus fungsi, kerangka karbon, konformasi dan stereokimia). 2. Sifat-sifat fisik dan kimia serta kegunaan senyawa hidrokarbon (alkana, alkena, alkuna), alkil halida, alkohol, eter, benzena dan turunannya, senyawa karbonil, dan amina. 3. Reaksi-reaksi dasar kimia organik, di antaranya reaksi halogenasi alkana, reaksi substitusi nukleofilik, eliminasi, reaksi redoks, sikloadisi Diels-Alder, dan reaksi substitusi elektrofilik dan nukleofilik pada benzena dan turunannya, adisi nukleofilik, dan kondensasi pada karbon-alfa senyawa karbonil. 4. Aspek kualitatif dan kuantitatif reaksi substitusi dengan penerapan persamaan Hammett. 5. Pengenalan teknik dasar pemisahan dan pemurnian zat cair dan zat padat (distilasi, 	<ol style="list-style-type: none"> 1. Structure (chemical bonds, resonance concepts, acid-base concepts, functional groups, carbon framework, conformation, and stereochemistry). 2. Physical and chemical properties and uses of hydrocarbon compounds (alkanes, alkenes, alkynes), alkyl halides, alcohols, ethers, benzene and its derivatives, carbonyl compounds, and amines. 3. Basic organic chemistry reactions, including alkane halogenation reactions, nucleophilic substitution reactions, elimination, redox reactions, Diels-Alder cycloaddition, and electrophilic and nucleophilic substitution reactions on benzene and its derivatives, nucleophilic addition, and condensation on the alpha-carbon of carbonyl compounds. 4. Qualitative and quantitative aspects of substitution reactions with the application of the Hammett equation. 5. Introduction to basic techniques of separation and purification of liquids and solids

- sublimasi dan berbagai teknik kromatografi).
6. Pengenalan teknik dasar isolasi senyawa organik secara ekstraksi dari bahan alam dan karakterisasinya.
 7. Pengenalan teknik reaksi sederhana (reaksi substitusi nukleofilik, reaksi eliminasi, reaksi adisi, reaksi Diels-Alder) dan karakterisasinya.
 8. Mempelajari sifat dan kereaktifan senyawa organik berdasarkan gugus fungsinya melalui uji kualitatif senyawa hidrokarbon, alkohol dan fenol.
 9. Mampu menyampaikan hasil eksperimen dan/atau hasil penelusuran literatur secara tulisan dan/atau lisan dengan mengedepankan etika dan kejujuran.

- (distillation, sublimation, and various chromatography techniques).
6. Introduction to basic techniques of isolating organic compounds by extraction from natural materials and their characterization.
 7. Introduction to basic reaction techniques (nucleophilic substitution reactions, elimination reactions, addition reactions, Diels-Alder reactions) and their characterization.
 8. Studying the properties and reactivity of organic compounds based on their functional groups through qualitative tests of hydrocarbons, alcohols, and phenols.
 9. Able to present experiment results and/or literature review findings in writing and/or verbally, emphasizing ethics and honesty.

Capaian Pembelajaran Mata Kuliah (CPMK)

1. Mampu menjelaskan sifat fisik senyawa organik melalui penggambaran struktur molekul, struktur resonansi, konformasi, dan/atau stereokimianya.
2. Mampu menjelaskan sifat kimia senyawa organik melalui penggambaran skema dan mekanisme reaksi-reaksi dasar dalam kimia organik (reaksi substitusi (nukleofilik dan elektrofilik), eliminasi, adisi (nukleofilik dan elektrofilik), dan adisi perisiklik (Diels-Alder).
3. Mampu menuliskan reaksi sintesis senyawa organik sederhana dengan menggunakan reaksi-reaksi substitusi, adisi dan eliminasi.
4. Mampu menjelaskan aspek kualitatif dan kuantitatif reaksi substitusi menggunakan persamaan Hammett.

1. Able to explain the physical properties of organic compounds through the depiction of molecular structure, resonance structure, conformation, and/or stereochemistry.
2. Able to explain the chemical properties of organic compounds through the depiction of schemes and mechanisms of basic reactions in organic chemistry (substitution reactions (nucleophilic and electrophilic), elimination, addition (nucleophilic and electrophilic), and pericyclic addition (Diels-Alder).
3. Able to write synthesis reactions of simple organic compounds using substitution, addition, and elimination reactions.
4. Able to explain the qualitative and quantitative aspects of substitution reactions using the Hammett equation.

	<ol style="list-style-type: none"> 5. Mampu melakukan teknik dasar pemisahan dan pemurnian zat cair dan zat padat (distilasi, sublimasi dan berbagai teknik kromatografi). 6. Mampu melakukan teknik dasar ekstraksi untuk isolasi senyawa organik dari bahan alam dan karakterisasinya. 7. Mampu melakukan reaksi sederhana (reaksi substitusi nukleofilik, reaksi eliminasi, reaksi adisi, reaksi Diels-Alder, dan reaksi esterifikasi). 8. Mampu mengidentifikasi sifat dan kereaktifan senyawa organik berdasarkan gugus fungsinya melalui uji kualitatif senyawa hidrokarbon, alkohol dan fenol. 9. Mampu menyampaikan hasil eksperimen dan/atau hasil penelusuran literatur secara tulisan dan/atau lisan dengan mengedepankan etika dan kejujuran. 	<ol style="list-style-type: none"> 5. Able to perform basic techniques for the separation and purification of liquids and solids (distillation, sublimation, and various chromatography techniques). 6. Able to perform basic extraction techniques for the isolation of organic compounds from natural materials and their characterization. 7. Able to perform simple reactions (nucleophilic substitution reactions, elimination reactions, addition reactions, Diels-Alder reactions, and esterification reactions). 8. Able to identify the properties and reactivity of organic compounds based on their functional groups through qualitative tests of hydrocarbons, alcohols, and phenols. 9. Able to present experimental results and/or literature review findings in writing and/or verbally, emphasizing ethics and honesty.
Metode Pembelajaran	Ceramah Tutorial Diskusi, presentasi kelompok Praktikum	Lecture Tutorial Discussion, group presentations Lab work
Modalitas Pembelajaran	Luring Sinkron Daring Asinkron Praktikum di laboratorium	Synchronous offline (in-person) Asynchronous online Lab work in the laboratory
Jenis Nilai	ABCDE	
Metode Penilaian	<p>Nilai Akhir = 75% x ((UTS (35%) + UAS (35%) + Tugas Presentasi 20% + rata-rata tugas mandiri dan Kuis (10%)) + 25% x nilai praktikum</p> <p>INDEKS NILAI: 75 ≥ A; 75 < AB ≤ 68; 68 < B ≤ 60; 60 < BC</p>	<p>Final Grade = 75% x ((Mid-Term Exam (35%) + Final Exam (35%) + Presentation Assignment (20%) + Average of Individual Assignments and Quizzes (10%)) + 25% x Practicum Grade</p> <p>GRADE INDEX:</p>

≤ 55 ; $55 < C \leq 50$; $50 < D \leq 45$; $45 < E$ Penilaian
Praktikum: Nilai Akhir = Nilai Praktikum Harian
(60%) + Nilai Ujian Praktikum (40%). Nilai
Praktikum harian = Jurnal dan Tugas Pendahuluan
(15%) + Tes Awal (15%) + Kerja (35%) + Laporan
(35%) Nilai Ujian Praktikum = Nilai Ujian Praktek
(50%) + Nilai Ujian Tertulis (50%) Kelulusan
praktikum salah satunya ditentukan dari kehadiran
minimal 80% dan nilai total praktikum minimal 55.

$75 \geq A$; $75 < AB \leq 68$; $68 < B \leq 60$; $60 < BC \leq 55$; 55
 $< C \leq 50$; $50 < D \leq 45$; $45 < E$ Practicum
Assessment: Final Grade = Daily Practicum Grade
(60%) + Practicum Exam Grade (40%). Daily
Practicum Grade = Journal and Preliminary
Assignments (15%) + Initial Test (15%) + Work
(35%) + Report (35%) Practicum Exam Grade =
Practical Exam Grade (50%) + Written Exam Grade
(50%) Passing the practicum is determined by at
least 80% attendance and a minimum total
practicum grade of 55.

Catatan Tambahan