

## SINOPSIS KURSUS

### JABATAN KIMIA

**Nama Kursus : Kimia Am (*General Chemistry*)**  
**Kod Kursus : CHM 2000**  
**Kredit : 4(3+1)**  
**Prasyarat : Tiada**  
**Sinopsis Kursus :**

Kursus ini meliputi nama umum dalam bidang kimia fizik, tak organik dan organik. Struktur atom dan jadual berkala, ikatan kimia dan struktur, stoikiometri, keadaan jirim, keseimbangan kimia, kinetik kimia, elektrokimia, kimia bukan logam dan logam dibincangkan. Penamaan, sifat dan tindak balas beberapa kumpulan berfungsi sebatian organik juga dibincangkan.

*(This course covers general topics in physical, inorganic and organic chemistry. Atomic structure and periodic table, stoichiometry, state of matter, chemical equilibrium, chemical kinetics, electrochemistry, chemistry of nonmetals and metals are discussed. Nomenclature, properties, and reactions of various functional groups of organic compounds are also discussed.)*

**Nama kursus : Kimia Fizik dan Tak Organik (*Physical and Inorganic Chemistry*)**  
**Kod Kursus : CHM 3010**  
**Kredit : 4(3+1)**  
**Prasyarat : Tiada**  
**Sinopsis Kursus :**

Kursus ini merangkumi beberapa aspek asas dalam kimia fizik dan tak organik termasuk teori atom moden, jadual berkala dan sifat berkala, kimia kumpulan utama, teori pengikatan, sifat gas, cecair dan pepejal, keseimbangan kimia, elektrokimia, termodinamik, kinetik dan kimia nukleus.

*(This course covers several basic aspects of physical and inorganic chemistry, including modern atomic theory, periodic table and periodic properties, main group element, theory of bonding, properties of gas, liquid and solid, chemical equilibrium, electrochemistry, thermodynamics, kinetics and nuclear chemistry.)*

**Nama kursus : Kimia Fizik (*Physical Chemistry*)**  
**Kod Kursus : CHM 3101**  
**Kredit : 4(3+1)**  
**Prasyarat : CHM 3010**  
**Sinopsis Kursus :**

Kursus ini merangkumi aspek kimia fizik berkaitan dengan teori kinetik dan tindak balas kompleks. Hukum termodinamik, larutan, keseimbangan fasa, elektrolit dan elektrokimia, koloid dan kuantum mekanik turut dibincangkan.

*(This course covers the aspect of (physical chemistry) related to kinetic theory, reaction mechanism and complex reactions. Thermodynamic laws, solutions, phase equilibrium, electrolytes, electrochemistry, colloids and quantum mechanics are also discussed.)*

**Nama Kursus : Kimia Polimer (*Polymer Chemistry*)**  
**Kod Kursus : CHM 3102**  
**Kredit : 3(2+1)**  
**Prasyarat : CHM 3010**  
**Sinopsis Kursus :**

Kursus ini merangkumi nama yang berkaitan dengan jenis polimer, mekanisma, kinetik pempolimeran, pengkopolimeran, larutan polimer, penentuan berat molekul, keadaan berkaca, analisis terma polimer, kekenyalan getah dan kelikatkenyalan.

*(This course covers topics related to types of polymers, mechanism and kinetics of polymerisation, copolymerisation, polymer solution, determination of molecular weight, glassy state, thermal analysis of polymers, rubber elasticity and viscoelasticity.)*

**Nama Kursus : Kinetik Kimia (Chemical Kinetics)**  
**Kod Kursus : CHM 3103**  
**Kredit : 3(2+1)**  
**Prasyarat : CHM 3101**  
**Sinopsis Kursus :**

Kursus ini merangkumi nama berkaitan dengan kinetik kimia dalam fasa gas dan cecair, tindak balas bermangkin asid bes dan enzim, jerapan, tindak balas permukaan dan cepat.

*(This course covers topics related to chemical kinetics in the gases and liquid phases, acid base catalysis and enzymatic reactions, adsorption, surface and fast reactions)*

**Nama Kursus : Termodinamik Kimia (Chemical Thermodynamics)**  
**Kod Kursus : CHM 3104**  
**Kredit : 3 (2+1)**  
**Prasyarat : CHM 3101**  
**Sinopsis Kursus :**

Kursus ini meliputi nama hukum termodinamik dan kegunaannya dalam bidang kimia termasuk perubahan fizikal bahan tulen, larutan, keseimbangan kimia dan keseimbangan fasa.

*(This course includes topics in laws of thermodynamic and their applications in chemistry including physical changes of pure compounds, solutions, chemical equilibrium and phase equilibrium.)*

**Nama Kursus : Kimia Organik I (Organic Chemistry I)**  
**Kod Kursus : CHM 3201**  
**Kredit : 4(3+1)**  
**Prasyarat : Tiada**  
**Sinopsis Kursus :**

Kursus ini meliputi nama struktur, ikatan, tatanama, sifat, tindak balas, sintesis dan kepentingan berbagai kelas sebatian organik, serta pengisomeran optik.

*(This course covers topics related to structure, bonding, nomenclature, properties, reactions, synthesis and the importance of the various classes of organic compounds, as well as optical isomerism.)*

**Nama Kursus : Kimia Organik II (Organic Chemistry II)**  
**Kod Kursus : CHM 3202**  
**Kredit : 4(3+1)**  
**Prasyarat : CHM 3201**  
**Sinopsis Kursus :**

Kursus ini meliputi nama stereokimia dan analisis konformasi, tindak balas penukargantian aromatik, kimia aromatik lanjutan, pengenalan kepada sebatian heterosiklik dan semulajadi serta sintesis organik.

*(This course covers topics in stereochemistry and conformational analysis, aromatic substitution reaction, advanced aromatic chemistry, introduction to heterocyclic and natural products compounds, and organic synthesis.)*

**Nama Kursus : Kimia Organik III (Organic Chemistry III)**  
**Kod Kursus : CHM 3203**  
**Kredit : 3(2+1)**  
**Prasyarat : CHM 3201**  
**Sinopsis Kursus :**

Kursus ini merangkumi nama berkaitan dengan sintesis organik, penggunaan sebatian organologam, pengoksidaan dan penurunan, tindak balas bersekali dan elektrosiklik, serta strategi sintesis dalam kimia organik.

*(This course covers topics related to organic synthesis, the use of organometallic compounds, oxidation and reduction, concerted and electrocyclic reactions and synthetic strategies in organic chemistry).*

**Nama Kursus : Kimia Organik IV (Organic Chemistry IV)**  
**Kod Kursus : CHM 3204**  
**Kredit : 4(3+1)**  
**Prasyarat : CHM 3203 dan CHM 3402**  
**Sinopsis Kursus :**

Kursus ini merangkumi nama biosintesis metabolit sekunder, termasuk terbitan asid syikimik, sebatian  $C_6-$   $C_n$  sebatian sterpenoid dan steroid, biosintesis alkaloid berdasarkan asid amino alifatik, asid amino aromatik dan triptofan, biosintesis alkaloid morfina, feromon dan kairomon, dan saling tindak tumbuhan-tumbuhan dan tumbuhan-serangga dengan lebih mendalam. Selain daripada itu, penggunaan lanjut kaedah spektroskopi dalam penentuan struktur organik, konsep fotokimia serta nama-nama penting dalam kimia organik fizik akan dibincangkan

*(This course covers topics related to biosynthesis of secondary metabolites, including shikimic acid derivatives,  $C_6-$   $C_n$  compounds, terpenoids and steroids, biosynthesis of alkaloids based on aliphatic amino acid, aromatic amino acids and tryptophan, morphine alkaloid biosynthesis, pheromones and chryomones, plant-plant and plant-insect interactions. Besides that, further applications of spectroscopic methods in structural elucidation, concepts on photochemistry and few main topics in physical organic chemistry will also be discussed).*

**Nama Kursus : Kimia Tak Organik I (Inorganic Chemistry I)**  
**Kod Kursus : CHM 3301**  
**Kredit : 3(2+1)**  
**Prasyarat : CHM 3010**  
**Sinopsis Kursus :**

Kursus ini merangkumi konsep asas dalam kimia tak organik, simetri, kumpulan titik, kimia hablur, kecacatan hablur, larutan pepejal, oksida, silikat dan hidrida.

*(This course covers basic concepts in inorganic chemistry, symmetry, point group, crystal chemistry, crystal defects, solid solutions, oxides, silicates and hydrides.)*

**Nama Kursus : Kimia Tak Organik II (*Inorganic Chemistry II*)**  
**Kod Kursus : CHM 3302**  
**Kredit : 3(2+1)**  
**Prasyarat : CHM 3301**  
**Sinopsis Kursus :**

Kursus ini merangkumi beberapa sifat umum unsur dan kompleks logam peralihan, penggunaan teori kumpulan dalam menentukan simetri kompleks orbital atom dan molekul, teori ikatan logam-ligan dan pendekatan teori berkenaan dalam menerangkan spektrum elektronik, sifat kemagnetan kompleks logam peralihan, kereaktifan dan mekanisma, kaedah sintesis semasa penyediaan sebatian tak organik dan organologam, dan pengenalan kepada kimia bioinorganik asas.

*(This course covers several general properties of elements and complexes of transition metals, the application of group theory in assigning the symmetry of metal complexes, atomic and molecular orbitals, metal-ligand bonding theories and their approaches toward explaining the electronic spectra, magnetic properties of transition metal complexes, reactivity and mechanisms, current synthetic methods of inorganic and organometallic compounds, and an introduction to basic bioinorganic chemistry.)*

**Nama Kursus : Kimia Tak Organik III (*Inorganic Chemistry III*)**  
**Kod Kursus : CHM 3303**  
**Kredit : 3(2+1)**  
**Prasyarat : CHM 3301**  
**Sinopsis Kursus :**

Kursus ini meliputi nama logam peralihan, logam nadir bumi dan sebatian organologam serta kegunaannya dalam industri khususnya di dalam pemangkinan homogen dan heterogen.

*(This course covers transition metals, rare earth metals and organometallic compounds as well as their uses in industry, especially in homogeneous and heterogeneous catalysis.)*

**Nama Kursus : Kimia Tak Organik IV (*Inorganic Chemistry IV*)**  
**Kod Kursus : CHM 3304**  
**Kredit : 3 (2+1)**  
**Prasyarat : CHM 3302**  
**Sinopsis Kursus :**

Kursus ini merangkumi konsep penting dalam kimia tak organik termasuk kecacatan kimia, larutan pepejal, organologam dan mekanisma tindak balas. Perbincangan mengenai nama pilihan bagi tujuan pendedahan kepada bahan dan perkembangan baru dalam kimia takorganik diberikan.

*(This course covers important concepts in inorganic chemistry including crystal defects, solid solutions, organometallic compounds and reaction mechanisms. Discussion on selected topics designed to expose students to new materials and developments in inorganic chemistry is given.)*

**Nama Kursus : Kimia Analisis (*Analytical Chemistry*)**  
**Kod Kursus : CHM 3401**  
**Kredit : 3(2+1)**  
**Prasyarat : CHM 3010**  
**Sinopsis Kursus :**

Kursus ini membincangkan kaedah asas dalam kimia analisis seperti titrimetri, gravimetri, kromatografi, elektrokimia, analisis terma, pemisahan pelarut, kaedah radiokimia dan analisis suntikan aliran.

*(This course discussed about basic method in analytical chemistry such as titrimetry, gravimetry, chromatography, electrochemistry, thermal analysis, solvent extraction, radiochemical methods and flow injection analysis.)*

**Nama Kursus : Spektroskopi Kimia (Chemical Spectroscopy)**  
**Kod Kursus : CHM 3402**  
**Kredit : 4(3+1)**  
**Prasyarat : CHM 3010, CHM 3201, CHM 3301 dan CHM 3202**  
**Sinopsis Kursus :**

Kursus ini merangkumi pengenalan kepada kaedah spektroskopi yang biasa digunakan dalam bidang analisis, seperti IR, UV, NMR, MS, AA, belauan sinar x, dan pendarfluor serta pentafsiran data spektroskopi ditekankan.

*(This course covers the introduction to spectroscopic methods commonly used in chemical analysis, such as IR, UV, NMR, MS, AA, X ray diffraction, and fluorescence, as well as interpretation of spectroscopic data is emphasised.)*

**Nama Kursus : Prinsip Teknologi Kimia (Chemical Technology Principles)**  
**Kod Kursus : CHM 3500**  
**Kredit : 4(4+0)**  
**Prasyarat : CHM 3101**  
**Sinopsis Kursus :**

Kursus ini merangkumiimbangan bahan,imbangan tenaga, pemindahan jisim, pemindahan haba, teknologi zarah, mekanik bendalir, penyulingan, penyerapan dan penyarian, penyejatan dan pengeringan, proses pemisahan, dan reaktor unggul.

*(This course covers materials balances, energy balances, mass transfer, heat transfer, particle technology, fluid mechanics, distillation, absorption and extraction, evaporation and drying, separation processes, and ideal reactors.)*

**Nama Kursus : Kimia Perindustrian I (Industrial Chemistry I)**  
**Kod Kursus : CHM 3501**  
**Kredit : 3(3+0)**  
**Prasyarat : CHM 3303**  
**Sinopsis Kursus :**

Kursus ini memperkenalkan beberapa aspek penting kimia perindustrian. Ini termasuk bekalan air industri, penghasilan dan kegunaan gas industri, ciri dan kegunaan bahan peletup dan propelan, punca dan penghasilan industri logam, fosforus dan sulfur, penghasilan cat, varnis dan dakwat, ciri-ciri dan pembuatan simen, konkrit dan seramik.

*(In this course, several important aspects of industrial chemistry are presented. These include industrial water supply, production and use of industrial gases, characteristics and use of explosives and propellants, supply and production in the metals, phosphorus and sulphur industries, manufacture of paint, varnish and ink, characteristics and production of cement, concrete and ceramics.)*

**Nama Kursus : Kimia Perindustrian II (*Industrial Chemistry II*)**  
**Kod Kursus : CHM 3502**  
**Kredit : 3(3+0)**  
**Prasyarat : CHM 3202**  
**Sinopsis Kursus :**

Kursus ini merupakan lanjutan kajian Kimia Perindustrian I. Nama yang dibincangkan termasuk teknologi arang batu, proses penapaian dalam perindustrian, industri gula dan kanji, petroleum dan bahan petrokimia, ciri dan pembuatan sabun dan detergen, penghasilan dan kegunaan bahan farmasi dan kosmetik, industri pewarna dan pigmen, sintesis dan formulasi racun rumpai, racun kulat dan racun serangga.

*(This course is an extension of Industrial Chemistry. The topics discussed include charcoal technology, industrial fermentation processes, sugar and starch industries, petroleum and petrochemicals, characteristics and manufacture of soaps and detergents, production and use of pharmaceuticals and cosmetics, the dyes and pigments industry, the synthesis and formulation of herbicides, fungicides and insecticides.)*

**Nama Kursus : Kimia Polimer Perindustrian (*Industrial Polymer Chemistry*)**  
**Kod Kursus : CHM 3503**  
**Kredit : 3(3+0)**  
**Prasyarat : CHM 3102**  
**Sinopsis Kursus :**

Kursus ini merangkumi kimia polimer gunaan. Nama perbincangan termasuk sifat, penyediaan, penggunaan, teknologi pengeluaran dan pemprosesan, pengubahsuaian kimia dan kawalan mutu dan kos plastik, getah dan getah tiruan, pengeluaran dan penggunaan gentian buatan, gentian kaca dan karbon, pengeluaran dan penggunaan perekat, dan teknologi kayu dan kertas.

*(This course covers applied polymer chemistry. Topics of discussion include the characteristics, preparation, uses, production and processing technology, chemical modification and quality and cost control of plastics, rubber and synthetic rubber; the production and use of synthetic fibres, carbon fibres and fiberglass; the manufacture and use of adhesives; and wood and paper technology.)*

**Nama Kursus : Oleokimia (*Oleochemistry*)**  
**Kod Kursus : CHM 3504**  
**Kredit : 3(2+1)**  
**Prasyarat : CHM 3202**  
**Sinopsis Kursus :**

Kursus ini merangkumi berbagai aspek minyak dan lemak termasuk terbitan oleokimia. Ia menekankan penggunaan teknologi terkini termasuk mikroemulsi dan bioteknologi. Lawatan ke kilang pengeluaran minyak dan lemak diatur.

*(This course covers various aspects of oils and fats, including oleochemical derivatives. It emphasizes on the use of latest technology including microemulsion and biotechnology. Visits to factories producing oils and fats are arranged.)*

**Nama Kursus : Kimia Petroleum (*Petroleum Chemistry*)**  
**Kod Kursus : CHM 3601**  
**Kredit : 3(3+0)**

**Prasyarat : CHM 3202**

**Sinopsis Kursus :**

Kursus ini merangkumi berbagai aspek dan elemen dalam industri petroleum. Ia melibatkan nama asal-usul minyak dan gas, geosains, pengembangan dan struktur industri petroleum, eksplorasi dan kaedah pengeluaran.

*(This course covers various aspect and elements of petroleum industry. It involves lectures on origin of oil and gas, geoscience, development and structure of petroleum industry, exploration and method of production.)*

**Nama Kursus : Proses Penapisan Petroleum (Petroleum Refining Processes)**

**Kod Kursus : CHM 3602**

**Kredit : 3(3+0)**

**Prasyarat : CHM 3601**

**Sinopsis Kursus :**

Kursus ini merangkumi pengenalan, hasil penapisan, bahan suapan penapisan, penyulingan minyak mentah, proses pengkokan tertunda, pembentukan semula bermangkin dan pengisomeran, peretakan bermangkin penghidrorawatan, penghidroretakan bermangkin, pengalkilan, pengadunan bahan hasil dan proses sokongan

*(This course covers introduction, refinery products, refinery, feedstocks, crude distillation, delayed coking, catalytic reforming and isomerisation, catalytic cracking, hydrotreating, catalytic hydrocracking, alkylation, product blending and supporting processes.)*

**Nama Kursus : Petrokimia (Petrochemicals)**

**Kod Kursus : CHM 3603**

**Kredit : 3(3+0)**

**Prasyarat : CHM 3601**

**Sinopsis Kursus :**

Kursus ini melibatkan perbincangan proses menyediakan bahan perantaraan kimia termasuk keadaan dan carta-alir bagi menghasilkan bahan kimia atau bahan akhir dari bahan-bahan petroleum untuk kegunaan bukan bahan api. Nama-nama kursus ialah bahan-bahan petrokimia dari metana, etana-etilena, propana-propilena, butana-butilena dan hidrokarbon aromatik. Pembuatan plastik, elastomer, detergen dan bahan hasil khusus.

*(This course deals with processes for production, of chemicals intermediate including conditions and flow-chart to produce either chemicals of finish products from petroleum. Topics in this course include petrochemicals from methane, ethane-ethylene, propane-propylene, butane-butylene and aromatic hydrocarbons. Productions of plastics, elastomers, detergents and other special products)*

**Nama Kursus : Kawalan Tumpahan Minyak (Oil Spill Control)**

**Kod Kursus : CHM 3604**

**Kredit : 3 (3+0)**

**Prasyarat : CHM 3601**

**Sinopsis Kursus :**

Kursus ini merangkumi aspek tumpahan minyak dan kawalannya dalam industri petroleum. Ia termasuk perbincangan ciri tumpahan minyak, perawatan kimia-fizikal dan biologi, ekonomi dan peraturan antarabangsa mengenai tumpahan minyak. Lawatan ke agensi dan industri yang terlibat dalam kawalan tumpahan minyak.

*(This course covers aspects in controlling oil spill in the petroleum industry. It includes discussion on the spill characteristics, chemical-physical and biological treatments, economics, and international regulation on oil spill. A field trip to agencies and industries involved in oil spill control.)*

**Nama Kursus : Kimia Pengkomputeran (Computational Chemistry)**  
**Kod Kursus : CHM 3701**  
**Kredit : 4(3+1)**  
**Prasyarat : CHM 3101**  
**Sinopsis Kursus :**

Kursus ini merangkumi aspek kimia pengkomputeran termasuk pengenalan kepada kimia pengkomputeran dan pemodelan molekul, mekanik kuantum, mekanik molekul dan dinamik molekul, mekanik statistik, hubungan struktur-sifat, pengiraan simbolik, kepintaran buatan dan penvisualan.

*(This course covers aspects of computational chemistry including introduction to computational chemistry and molecular modeling, quantum mechanics, molecular mechanics and molecular dynamics, statistical mechanics, structure-property relationship, symbolic calculations, artificial intelligent and visualization.)*

**Nama Kursus : Kimia Perindustrian (Industrial Chemistry)**  
**Kod Kursus : CHM 4001**  
**Kredit : 3(3+0)**  
**Prasyarat : CHM 3010 dan CHM 3201**  
**Sinopsis Kursus :**

Kursus ini merangkumi pemprosesan bahan sumber asli seperti petroleum, getah asli, minyak sayur, lemak haiwan, sulfur, nitrogen, timah, besi, aluminium dan industri berasaskan bahan kimia, polimer sintetik, sabun, detergen, cat, pigmen dan simen.

*(This course covers the processing of natural resources such as petroleum, natural rubber, vegetable oils, animal fats, sulfur, nitrogen, tin, iron, aluminium, and industries based on chemicals, synthetic polymer, soap, detergents, paints, pigments and cement.)*

**Nama Kursus : Kimia Keadaan Pepejal (Solid State Chemistry)**  
**Kod Kursus : CHM 4101**  
**Kredit : 3 (3+0)**  
**Prasyarat : CHM 3101 dan CHM 3301**  
**Sinopsis Kursus :**

Kursus ini merangkumi struktur, taburan elektron dan kecacatan dalam hablur serta kesan mereka ke atas kekonduksian, tindak balas pepejal dan pemangkinan.

*(This course covers structure, electronic distribution and defects in crystals and their effects on conductivity, solid state reactions and catalysis.)*

**Nama Kursus : Elektrokimia (Electrochemistry)**  
**Kod Kursus : CHM 4102**  
**Kredit : 3(3+0)**  
**Prasyarat : CHM 3101, CHM 3401**  
**Sinopsis Kursus :**

Kursus ini meneliti dengan mendalam perkara-perkara yang berkaitan dengan elektrokimia seperti aktiviti ion, nombor angkatan, kekonduksian, persamaan Debye-Huckel dan Onsager, keupayaan elektrod berbalik, lapisan berganda elektrik, proses elektrod, voltametri, potensiometri (elektrod pemilih ion), dan pengelektroenanapan.

*(This course studies indepth various topics in elelctrochemistry such as ion activity, transport number, ionic mobility, conductance, Debye-Huckel and Onsager equations, reversibility of electrode potential, electrical double layer, electrode processes, voltammetry, potentiometry (ion selective electrode) and electrodeposition.)*

**Nama Kursus : Topik Khas dalam Kimia Organik  
(Special Topics in Organic Chemistry)**

**Kod Kursus : CHM 4201**

**Kredit : 3(3+0)**

**Prasyarat : Dengan Kebenaran Jabatan**

**Sinopsis Kursus :**

Kursus ini merangkumi perbincangan mendalam tentang topik-topik terpilih dalam kimia organik lanjutan yang akan ditentukan oleh Jabatan.

*(This course covers depth discussion on selected topics in advanced organic chemistry determined by the Department.)*

**Nama Kursus : Pemangkinan (Catalysis)**

**Kod Kursus : CHM 4701**

**Kredit : 3(3+0)**

**Prasyarat : CHM 3101**

**Sinopsis Kursus :**

Kursus ini merangkumi pengenalan kepada mangkin, pengkelasan mangkin heterogen, teknik-teknik penyediaan, proses penjerapan, tindak balas permukaan, mekanisma tindak balas dan penciriannya. Aplikasi mangkin di dalam industri petroleum, industri kimia halus, sintesis sebatian organik dan pengawalan pencemaran alam sekitar turut dibincangkan.

*(This course covers introduction of catalyst, the classification of heterogenous catalyst, preparation techniques, adsorption process, surface reaction, reaction mechanism and its characterisation. The application of catalysts in petroleum and fine chemical industries, synthesis of organic compounds and controlling environmental pollution will be discussed.)*

**Nama Kursus : Latihan Industri  
(Industrial Training)**

**Kod Kursus : CHM 4901**

**Kredit : 4(0+4)**

**Prasyarat : Dengan kebenaran Jabatan**

**Sinopsis Kursus :**

Kursus ini meliputi latihan industri selama 8 minggu di agensi kerajaan atau beberapa syarikat syarikat atau kilang industri terpilih. Latihan dikendalikan bersama oleh penyelarasan dan seorang penyelia atau pengurus dari agensi atau syarikat atau kilang tersebut.

*(This course covers an industrial training for a period of 8 weeks at various selected government agencies, companies or factories. The training is organised jointly by the coordinator and supervisor or the manager from the related agencies, company or factory.)*

**Nama Kursus : Projek Ilmiah Tahun Akhir (*Final Year Academic Project*)**  
**Kod Kursus : CHM 4999**  
**Kredit : 6(0+6)**  
**Prasyarat : Pelajar Sulung Kimia/Kimia Perindustrian/Kimia Petroleum**  
**Sinopsis Kursus :**

Kursus ini merangkumi sorotan bahan rujukan, penggunaan teknik penyelidikan yang sesuai, pengumpulan dan analisis data, penafsiran keputusan, perbincangan dan kesimpulan kajian saintifik dalam projek penyelidikan atau projek multimedia.

*(This course covers literature review, use of appropriate reseach techniques, data collection and analyses, interpretation of results, discussion and conclusion of scientific studies in research and multimedia project.)*