Covenant University
College of Science and Technology
Department of Chemistry
Office of the HOD (-Ext 7027)

COURSE ALLOCATION FOR OMEGA 2020/2021 ACADEMIC SESSION

College	Science and Technology (CST)
Department	Chemistry
Programme(s)	Industrial Chemistry Industrial Chemistry – Analytical and Environmental Option Industrial Chemistry – Polymer and Material Science Option
Examination Officer	Dr. Akinsiku A. A.
Chief Examiner	Prof. Olugbuyiro J.A.O.
External Examiner/Rank/Affiliation	Prof. Adeniyi A. A. /Professor/ Department of Chemistry, Lagos State University (LASU)

S/N	Course Codes	Course Titles	Nature of Course	Name of Lecturers	Staff ID's	Mobile Nos
1.	CHM 121 (C)	General Organic Chemistry	Theory	Prof. Ajani O. O.	(CU/05/202)	08061670254
				Prof. Olugbuyiro J. A. O.	(CU/05/180)	08034112751
				Dr. Ajanaku C. O.	**(CU/13/161)**	08035701193
				Dr. Olanrewaju I. O.	(CU/09/127)	08036943336
				Mr. Geiser R. J.	I.V. Scholar	
2.	CHM 122 (C)	General Inorganic	Theory	**Dr. Adekoya J. A.**	**(CU/03/291)**	08056532188
				Prof. Oluwafemi S. O.	Visiting Prof.	
				Dr. Adebisi A. A.	(CU/16/157)	09037337473
				Mr. Ajayi S.O.	(CU/18/064)	07064650372
3.	CHM 123 (C)	General Organic Chemistry for Engineering Students	Theory	Prof. Ajani O. O.	(CU/05/202)	08061670254
				Prof. Olugbuyiro J. A. O.	(CU/05/180)	08034112751
				Dr. Ajanaku C. O.	(CU/13/161)	08035701193
				Dr. Olanrewaju I. O.	(CU/09/127)	08036943336
				Mr. Izuogu D. C.	I.V. Scholar	
4.	CHM 129 (P)	General Chemistry Practical II	Practical	Dr. Anake W. U.	(CU/10/052)	08038384319
				Dr. Akinsiku A. A.	(CU/10/210)	08038053683
				Dr. Adebisi A. A.	(CU/16/157)	09037337473
				Dr. Etchie A. T.	(CU/17/088)	09064915988
				Dr. Aladesuyi O.	(CU/13/154)	09090357091
				Dr. Ajanaku C. O.	(CU/13/161)	08035701193
				Dr. Edobor-Osoh A.	(CU/09/120)	07063135227
				Dr. Olanrewaju I. O.	(CU/09/127)	08036943336
				Dr. Adedapo E. A.	(CU/13/169)	08060186404
				Dr. Fred-Ahmadu O. H.	**(CU/16/147)**	08033567301

				Mrs. Ademosun O. T.	(CU/17/040)	07030860052
				Mr. Ajayi S. O.	(CU/18/064)	07064650372
5.	CHM 221 (C)	Basic Organic Chemistry	Theory	**Prof. Ajani O. O.**	**(CU/05/202)**	08061670254
				Prof. Olugbuyiro J. A. O.	(CU/05/180)	08034112751
				Dr. Ajanaku C. O.	(CU/13/161)	08035701193
				Dr. Olanrewaju I. O.	(CU/09/127)	08036943336
				Geiser R. J. / Izuogu D.C.	I.V. Scholar	
6.	CHM 222 (C)	Analytical Chemistry	Theory	Prof. Benson N. U.	(CU/05/171)	08138501505
				Dr. Anake W. U.	**(CU/10/052)**	08038384319
				Dr. Etchie A. T.	(CU/17/088)	09064915988
				Dr. Kyari Yate	I.V. Scholar	
				Dr. Fred-Ahmadu O. H.	(CU/16/147)	08033567301
7.	CHE 222 (C)	Selected Topics in Chemistry for Non-Major	Theory	Dr. Adekoya J. A.	(CU/03/291)	08056532188
				Dr. Akinsiku A. A.	**(CU/10/210)**	08038053683
				Dr. Adebisi A. A.	(CU/16/157)	09037337473
8.	CHM 223 (C)	Physical Chemistry I	Theory	Dr. Udeme E.I.	(CU/20/041)	08160385501
				Dr. Ehi-Eromosele C. O.	**(CU/11/011)**	08039576084
				Dr. Edobor-Osoh A.	(CU/09/120)	07063135227
9.	CHM 224 (C)	Management & Chemical Industry I	Theory	**Dr. Aladesuyi O.**	**(CU/13/154)**	09090357091
				Mr. Izuogu D. C.	I.V. Scholar	
				Mrs. Ademosun O. T.	(CU/17/040)	07030860052
10.	CHM 225 (C)	Industrial Raw Material Resource Inventory	Theory	**Dr. Adekoya J. A.**	(CU/03/291)	08056532188
				Prof. Oluwafemi S. O.	(CU/13/138)	08116790147
11.	CHM 226 (P)	Experimental Physical Chemistry II	Practical	Dr. Udeme E.I.	(CU/20/041)	08160385501
				Dr. Ehi-Eromosele C. O.	(CU/11/011)	08039576084
				Dr. Edobor-Osoh A.	**(CU/09/120)**	07063135227
12	BCH 226 (C)	Experimental Physical Chemistry II	Theory	**Dr. Rotimi O.A.**		
				Dr. Rotimi G.N.		
				Miss. Dania O.E.		

13.	CHM 228 (P)	Experimental Organic Chemistry I	Practical	Prof. Ajani O. O.	(CU/05/202)	08061670254
				Prof. Olugbuyiro J.A.O.	(CU/05/180)	08034112751
				Dr. Ajanaku C. O.	**(CU/13/161)**	08035701193
				Dr. Olanrewaju I. O.	(CU/09/127)	08036943336
14.	CHM 229 (P)	Experimental Analytical Chemistry	Practical	Dr. Anake W. U.	(CU/10/052)	08038384319
				Dr. Etchie A. T.	**(CU/17/088)**	09064915988
				Dr. Adedapo E. A.	(CU/13/169)	08060186404
				Dr. Fred-Ahmadu O. H.	(CU/16/147)	08033567301
15.	CHM 329 (S)	SIWES	Practical	**Dr. Adedapo E. A.**	**(CU/13/169)**	08060186404
16.	CHM 421 (C)	Surface Chemistry & Electrochemistry	Theory	Dr. Udeme E.I.	(CU/20/041)	08160385501
				Dr. Ehi-Eromosele C. O.	**(CU/11/011)**	08039576084
17.	CHM 422 (C)	Petroleum Chemistry	Theory	**Dr. Siyanbola T. O.**	**(CU/07/212)**	08051156222
				Mr. Ajayi S. O.	(CU/18/064)	07064650372
18.	CHM 423 (E)	Polymer Technology	Theory	**Dr. Siyanbola T. O.**	**(CU/07/212)**	08051156222
				Dr. Solomon M.M.	(CU/20/043)	08068707074
				Dr. Akinsiku A. A.	(CU/10/210)	08038053683
19.	CHM 424 (E)	Introduction to Catalysis	Theory	Dr. Udeme E.I.	(CU/20/041)	08160385501
				Dr. Ehi-Eromosele C. O.	**(CU/11/011)**	**08039576084**
				Dr. Edobor-Osoh A.	(CU/09/120)	07063135227
20.	CHM 425 (E)	Ceramics and Composite Materials	Theory	**Prof. Ajanaku K. O.**	**(CU/07/025)**	08033575624
				Prof. Das S. K.	Visiting Prof.	
				Dr. Aladesuyi O.	(CU/13/154)	09090357091
21.	CHM 441 (E)	Food Chemistry	Theory	**Prof. Ajanaku K.O.**	**(CU/07/025)**	08033575624
				Dr. Siyanbola T. O.	(CU/07/212)	08051156222
				Dr. Ajanaku C. O.	(CU/13/161)	08035701193
				Mrs. Ademosun O. T.	(CU/17/040)	07030860052
22.	CHM 429 (C)	Research Project	Theory	**Prof. Benson N. U.**	**(CU/05/171)**	08138501505
				Prof. Ajani O. O.	(CU/05/202)	08061670254
				Dr. Adekoya J. A.	(CU/13/138)	08116790147
				Dr. Siyanbola T. O.	(CU/07/212)	08051156222
				Dr. Ehi-Eromosele C. O.	(CU/11/011)	08039576084
23.	CHM 448 (E)	Industrial Analytical Chemistry	Theory	**Prof. Benson N. U.**	**(CU/05/171)**	08138501505
				Dr. Anake W. U.	(CU/10/052)	08038384319

				Dr. Etchie A. T.	(CU/17/088)	09064915988

ADDITIONAL COURSES FOR ANALYTICAL/ENVIRONMENTAL OPTION

S/N	Course Codes	Course Titles	Nature of Course	Name of Lecturers	Staff ID's	Mobile Nos
1.	CHM241 (C)	Structure and Bonding	Theory	Dr. Solomon M.M.	(CU/20/043)	08068707074
				Dr. Adebisi A. A.	**(CU/16/157)**	09037337473
2.	CHM442 (E)	Chemical Oceanography	Theory	**Prof. Benson N. U.**	**(CU/05/171)**	08138501505
				Prof. Williams A. B.	(CU/04/122)	08036706086
				Dr. Adedapo E. A.	(CU/13/169)	08060186404
3.	CHM 461 (E)	Global Chemical Environmental Issues	Theory	**Prof. Benson N. U.**	**(CU/05/171)**	08138501505
				Dr. Adedapo E. A.	(CU/13/169)	08060186404
				Dr. Fred-Ahmadu O. H.	(CU/16/147)	08033567301
4.	CHM 462 (C)	General Concept in Environmental Chemistry	Theory	**Dr. Anake W. U.**	**(CU/10/052)**	08038384319
				Dr. Etchie A. T.	(CU/17/088)	09064915988
				Dr. Adedapo E. A.	(CU/13/169)	08060186404
5.	CHM 480 (C)	Separation Methods of Analysis	Theory	Prof. Williams A. B.	(CU/04/122)	08036706086
				Dr. Anake W. U.	**(CU/10/052)**	08038384319
				Dr. Kyari Yate	I.V. Scholar	
6.	CHM 481 (C)	Quantitative Spectroscop-ic Methods	Theory	Prof. Benson N. U.	(CU/05/171)	08138501505
				Dr. Etchie A. T.	**(CU/17/088)**	**09064915988**
				Dr. Kyari Yate	I.V. Scholar	
				Dr. Fred-Ahmadu O. H.	(CU/16/147)	08033567301
NB: Bold implies the Course and Practical Coordinators						

ADDITIONAL COURSES FOR MATERIAL AND POLYMER OPTION

S/N	Course Codes	Course Titles	Nature of Course	Name of Lecturers	Staff ID's	Mobile Nos
1.	CHM 240 (C)	Process Science II	Theory	Dr. Solomon M.M.	(CU/20/043)	08068707074
				Dr. Akinsiku A. A.	**(CU/10/210)**	08038053683
				Dr. Aladesuyi O.	(CU/13/154)	09090357091
				Mrs. Ademosun O. T.	(CU/17/040)	07030860052
				Mr. Ajayi S.O.	(CU/18/064)	07064650372
2.	CHM 420 (C)	Statistical Thermodynamics	Theory	**Dr. Udeme E.I.**	**(CU/20/041)**	08160385501
				Dr. Solomon M.M.	(CU/20/043)	08068707074
3.	CHM 446 (C)	Electrochemistry Cells And Corrosion	Theory	**Prof. Ajanaku K. O.**	**(CU/07/025)**	08033575624
				Dr. Aladesuyi O.	(CU/13/154)	09090357091
				Dr. Edobor-Osoh A.	(CU/09/120)	07063135227
4.	CHM 487 (C)	Basic Polymer Science II	Theory	**Dr. Siyanbola T. O.**	**(CU/07/212)**	08051156222
				Mrs. Ademosun O. T.	(CU/17/040)	07030860052
5.	CHM 488 (E)	Polymer Nanotechnology	Theory	**Dr. Solomon M.M.**	(CU/20/043)	08068707074
				Dr. Adekoya J. A.	(CU/03/291)	08056532188
NB: Bold implies the Course and Practical Coordinators						

COURSE CONTENTS

100 LEVEL

Omega Semester

CHM 121 - General Organic Chemistry (2 Units)
Introduction to and importance of organic chemistry. Qualitative analysis of organic compounds. Isolation and purification of organic compounds. Quantitative analysis of organic compounds. Determination of structure of organic compounds; empirical, molecular and structural formulas. Hybridization; formation of sp^3, sp^2, sp orbital in carbon. Homologous series and functional groups. Isomerism-structural and stereoisomerism. Aliphatic hydrocarbon chemistry: alkenes, alkenes, alkynes-nomenclature (IUPAC), physical properties, preparation and chemical reactions with simple mechanism where applicable.

CHM 122 - General Inorganic Chemistry (2 Units)
Chemical bonding and structure: ionic, covalent, coordinate covalent (dative), metallic, hydrogen bonding. General properties of compounds formed by the different types of bonding. Influence of bonding on size, shape and structure. Main Group Chemistry (Groups IA – VIIIA): trends in the properties of elements (structure, ionization energies, physical and chemical properties). Properties of selected types of compounds.

CHM 123 - General Organic Chemistry for Engineering Students (3 Units)
Purification techniques, empirical formula and molecular formula, ionic and covalent bonding, intermolecular forces, physical properties of molecules, *sp3,sp2, sp* orbital hybridization bonding models, homologous series, functional groups, isomerism, constitutional isomers and stereoisomers, alkanes, alkenes, alkynes, aromatics, alcohols, aldehydes, ketones, monocarboxylic acids, amines, amides and classes of compounds containing the carbonyl group, IUPAC names of the classes of organic compounds, glucose; monosaccharides and disaccharides, polysaccharides, common types of glycosidic linkages, amino acids and peptides; levels of protein structure, and properties, addition and condensation polymers; chain-growth and step-growth mechanisms of polymerization.

CHM 129 - General Chemistry Practical II (1 Unit)
Qualitative analysis for common captions and anions. Identification of organic functional groups: hydroxyl, carbonyl, carboxylic, amino groups, sugar, carbohydrate, protein, etc.

200 LEVEL

Omega Semester

CHM 221 - Basic Organic Chemistry (2 Units)

Factors affecting structure and physical properties of organic compounds; factors affecting availability of electrons. Stereochemistry, energy of activation and free radical substitution reactions in alkanes. Electrophilic and necleophilic substitution reactions. Aromaticity. Basic organic reactions, e.g. addition, free radical, elimination and condensation reactions etc. Some named organic reactions.

CHM 222 - Analytical Chemistry (3 Units)

Theory of errors, statistical treatment of data. Theory of sampling. Chemical methods of analysis including volumetric, gravimetric and physico-chemical methods, optical methods of analysis. Principles of solvent extraction. Introduction to separation methods of analysis.

CHE 222 - Chemistry for Chemical Engineering 11 (2 Units)

Basic organic reactions e.g. addition, free radical, elimination and condensation reactions etc. Some named organic reactions; Stereochemistry, energy of activation and free radical substitution reactions in alkanes, electrophilic and nucleophilic substitution reactions, aromaticity; Theory of errors, statistical treatment of data, theory of sampling, chemical methods of analysis including volumetric, gravimetric and physicochemical methods of analysis; Introduction to separation methods of analysis.

CHM 223 - Industrial Physical Chemistry (3 Units)

Chemical Kinetics: Theory of the rates of reaction in both gas phase and solutions. Complex reactions and catalysis. Electrolytic conductance. Measurement of conductance. Treatment of modern conductance. Qualitative treatment of Debye-Huckel theory. The Debye_Huckel limiting law. Applications of conductance measurements.

Thermodynamics: Zeroth and third laws of thermodynamics, solutions and colligative properties, chemical and phase equilibria.

CHM 224 - Management and Chemical Industry (2 Units)
Management theory. Management of personnel. Line and staff structure: functions and relationship. The Manager role. Organization structure and management structure. Authority and organization. Corporate policy and organizational constraints on management process. The decision process, managerial techniques, supportive information system. Introduction to the anatomy of management, industrial relations, public relations, Industrial psychology. General problem solving processes and creative thinking.

CHM 225 - Industrial Raw Material Resource Inventory (2 Units)
Survey of Nigeria's industries and their raw material requirements. Mineral resources. Raw materials from petroleum, coal. Plant and animal products. Potentials and applications of locally available raw materials as industrial feedstocks.

CHM 226 - Experimental Physical Chemistry II (1 Unit)
Determination of rate, rate constant and activation energy of a reaction. Determination of standard thermodynamic quantities of a reaction, phase rule. Application of electrochemical principles in titration reactions. Conductance measurements. Viscosity measurements.

CHM 228 - Experimental Organic Chemistry I (1 Unit)
A selection of experiments to illustrate principles taught in CHM221 course. Topics include qualitative organic analysis, organic preparation and preparation of crystalline organic derivatives.

CHM 229 - Experimental Analytical Chemistry (1 Unit)
The course is the practical component of CHM222 course. Topics include sampling technique and statistical treatment of data, solvent extraction, simple separation techniques and chromatography.

CHM240 - Process Science II (3 Units)
Mass transfer process; single phase and inter-phase, mass transfer drying as a heat-mass transfer process. Extraction and Absorption: solvent extraction in mixer settlers and columns; number of ideal stages; number of stages in gas absorption by HTU method; gas film and liquid film rate determining steps. Solid-liquid separation by filtration and sedimentation. Stoichiometry for systems involving recycles.

CHM241 - Structure and Bonding (2 units)
Idea of the quantum state, orbitals, shape; and energy. Simple valence theory, electron repulsion theory, atomic spectra. Methods of determining molecular shape, bond lengths and angles. The structure and chemistry of some representative main group element compounds

300 LEVEL

Omega Semester

CHM 329 - SIWES (6 Units)
Students will be attached to various chemical industries and allied companies immediately after the 300L alpha semester examination for six months. A programme of training will be drawn by the College and the Industry for each student, and a prescribed log book with daily recording of the student activities is to be kept by each student and appropriately signed. At the end of the programme each student will be required to submit a written report and give oral presentation on the same. The grading will normally be based on the reports, presentation and assessment by the Industry base Supervisor.

400 LEVEL

Omega Semester

CHM420 – Statistical Thermodynamics (3 Units)
Macroscopic properties in terms of microscopic. The Boltzmann distribution law. Partition functions. Statistical thermodynamic discussion of entropy; the third law of thermodynamics. Equilibria and chemical potentials; use of calorimetric data and of standard thermodynamics data tables.

CHM421 - Surface Chemistry and Electrochemistry (3 Units)
Thermodynamics and electrical surface phenomena. Adsorption at the gas-solid, liquid-gas, and solid-liquid interfaces. The Gibbs adsorption, Kelvin equation, Langmuir isotherm. Wetting and flotation. The colloidal state. Electrode processes. Electrochemical cells. Emf measurement and its applications Thermodynamics and kinetics of electrode processes.

CHM 422 - Petroleum Chemistry (2 Units)
Nature, Classification and Composition of crude petroleum and natural gases. Distribution of petroleum and natural gasses resources (the Global and Nigeria situations). Petroleum Technology. Survey of Refinery production and processes. Petrochemicals as industrial raw materials. Prospects for the Petrochemical industry in Nigeria.

CHM 423 - Polymer Technology (2 Units)
Structural characterization and physical properties of polymers. Manufacture, processing (injection, extrusion, compression, transfer moulding) and properties of major thermosetting resins, thermoplastics, elastomers and fibre forming polymers. Polymer additives. Polymeric surface coatings and adhesives.

CHM 424 – Introduction to Catalysis (2 Units)
General principles of catalytic processes. Homogeneous and heterogeneous catalysis. Kinetics and mechanisms of catalytic processes. Industrial applications of catalysis. Chemistry and structure of commercial catalysts.

CHM 425 - Ceramics and Composite Materials (2 Units)
Chemistry; structure and properties of soils containing useful clays. Ceramics: definition, structure, production, chemical and physical properties; and application. Composites: definitions, types, production, properties and applications of some commercial composites - glasses, cements.

CHM 429 - Research Project (6 Units)
Students are required at the 400 level to carry out research projects. The projects are sustained experimental investigations throughout the session on industrial or applied chemistry problems under the supervision of an academic member of staff. The project may be assigned to the student at the end of the 300 level. At the end of the investigation the student prepares a research project report. Assessment of the course is based on the report and students performance in the presentation of the report.

CHM 441 - Food Chemistry (2 Units)
The nature of food, vitamins, additives and adulterants; chemistry and microbiology of production processes and control. Food preservation and spoilage. Processing and preservation of local food stuffs. Formulation and practice of food standards.

CHM442 - Chemical Oceanography (2 Units)
Principles of chemical oceanography. Historical review. Water balance on earth - hydrological cycle. The ocean as a chemical system. Water. Sea water. Impact of electrolytes on structure - properties. Components of marine water. Speciation of the components of seawater. Chemical elements and forms in marine water. Photosynthesis and marine life cycle. Dissolved gases in seawater. Nutrients. Elements of physical, biological and geological oceanography.

CHM444 - Molecular Spectroscopy (2 Units)
The underlying principles of spectroscopy are examined using quantum mechanics, the interaction of light and matter, and group theory as starting points. The main focus of this course is the various forms of optical spectroscopy, including rotational, vibrational and electronic spectroscopy, as well as a brief look at photoelectron spectroscopy and lasers. The course finishes with an introduction to radiofrequency spectroscopy techniques, including nuclear magnetic resonance and electron spin resonance.

CHM446 - Electrochemistry Cells and Corrosion (2 Units)
The electrochemical double layer, electrode kinetics, mass transfer in electrochemical systems, electrocatalysis. Design of electrochemical reactors, current distribution. Porous electrodes. Survey of electrochemical processes and power sources. Get basic and advanced information on conductivity, ions, fuel cells, batteries, and electrodes. What is corrosion? Cost of corrosion. Electrochemical mechanisms involved in corrosion. Aqueous corrosion. High-temperature (hot) corrosion. Equipment selection for corrosive service: materials (alloy) selection, economics, codes & standards, design aspects. Corrosion control: Corrosion monitoring. Corrosion issues in specific industries: power generation, chemical processing, oil & gas, marine, etc.

CHM448 - Industrial Analytical Chemistry (2 units)
Food and drugs, Agrochemicals and soil, sampling and analysis of industrial waste.

CHM460 - Modern Chemical Kinetics (2 Units)
A thorough study of modern chemical kinetics and reaction dynamics. Topics will include atomic spectroscopy, microwave, infrared and UV-visible spectroscopy of diatomic and polyatomic molecules, lasers, creation and detection of excited states, fluorescence, phosphorescence, radiationless processes and photochemical transformations.

CHM461 - Global Chemical Environmental Issues (2 Units)
Climate change and Global Warming, Ozone layer depletion, Biological diversity, Oil and Gas Pollution, Control of International trade in toxic chemicals.

CHM462 - General Concept in Environmental Chemistry (2 Units)
Basic concepts: Environment, Ecosystem, pollution, Pollutants Surveillance, Monitoring, Guidelines, Standards, Regulations, Compliance.

CHM464 - Micro/Nano Processing Technology (2 Units)
The theory and technology of micro/nano fabrication. Basic processing techniques such as diffusion, oxidation, photolithography, chemical vapor deposition.

CHM480 - Separation Methods of Analysis (3 Units)
Separation methods – ion exchange, gas, paper, liquid and column electrophesis, Atomic and molecular emission and absorption techniques, electroanalytical techniques, titrimetric analysis, complexometric and precipitation, gravimetric contamination and appropriate handling of precipitates/crystals colorimetry.

CHM481 - Quantitative Spectroscopic Methods (2 Units)
Atomic absorption spectroscopy (flame and non-flame). Atomic emission spectroscopy, UV-Visible absorption Spectrophotometry, Turbidimetry.

CHM484 - Organometallic Chemistry (2 Units)
This course examines important transformations of organotransition-metal species with an emphasis on basic mechanisms, structure-reactivity relationships, and applications in organic synthesis.

CHM487 - Basic Polymer Science II (2 Units)
Determination of Molecular Weight, Polymer characterization: NMR Spectroscopy, Thermal Analysis , IR/Raman Spectroscopy, Chromatographic Techniques , Other Techniques.

CHM488 - Polymer Nanotechnology (2 Units)
Synthesis of Controlled Architecture Polymers, Characterisation of Morphology, Block Copolymers, Polymer Surfaces and Interfaces, Polymer Electronics, Polymer Photonics, Responsive Systems.