



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

M.Sc. CHEMISTRY

SEMESTER-I

COURSE: CHE-101-GENERAL CHEMISTRY-I

CO	COURSE OUTCOMES	LEVEL
C01	Understand the limitations of classical mechanics at molecular length scales.	L2
C02	Understand the differences between the classical and quantum mechanics.	L2
C03	Understand the basic principles and concepts of quantum mechanics.	L2
C04	Apply the principles of quantum mechanics to simple model systems relevance within chemistry.	L3
C05	Undersand the bases behind interaction between light and matter and account for the most common spectroscopic methods and their possibilities and limitations for studies of molecules in the MW,IR,and UV_Visible areas.	L2

COURSE: CHE: 102: INORGANIC CHEMISTRY-I

CO	COURSE OUTCOMES	LEVEL
C01	Predict the geometries of various simple molecules using VSEPR, VBT and MO theories.	L5
C02	Explain the various aspects of inorganic chains, rings, cages.	L2
C03	Describe about the splitting of d- orbitals in various geometries.	L2
C04	Estimate the spectral properties of complex compounds and predict the colour, magnetic properties of the complex compounds.	L5
C05	Interpret the electronic spectra of complex compounds and explain Orgel and Tanabe sugano diagrams	L2



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

COURSE: CHE: 103: ORGANIC CHEMISTRY-I

CO	COURSE OUTCOMES	LEVEL
CO1	Understand everything about reaction intermediates involved in organic reactions.	L2
CO2	Understand about aromatic, non-aromatic and anti-aromatic compounds.	L2
CO3	Understand concepts of stereo chemistry and will be able to stereo chemical aspects in organic chemistry.	L2
CO4	Classify nomenclature, structure, properties, syntheses, and reactions of the simple 3 to 7- member ring heterocyclic	L2
CO5	Understand the chemistry of the benzene ring fused ring heterocyclic.	L2

COURSE -104- PHYSICAL CHEMISTRY-I

CO	COURSE OUTCOMES	LEVEL
CO1	Understand everything about reaction intermediates involved in organic reactions.	L2
CO2	Understand about aromatic, non-aromatic and anti-aromatic compounds.	L2
CO3	Understand concepts of stereo chemistry and will be able to stereo chemical aspects in organic chemistry.	L2
CO4	Classify nomenclature, structure, properties, syntheses, and reactions of the simple 3 to 7- member ring heterocyclic	L2
CO5	Understand the chemistry of the benzene ring fused ring heterocyclic.	L2

COURSE: CHE: 105: INORGANIC CHEMISTRY LAB -I

CO	COURSE OUTCOMES	LEVEL
CO1	Analyze anions and cations present in a compound	L4
CO2	Divide interfering anions	L4
CO3	Analyze the principles involved in the preparations of complex compounds	L4
CO4	prepare the solutions	L3



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

COURSE: CHE: 106: ORGANIC CHEMISTRY LAB-I

CO	COURSE OUTCOMES	LEVEL
CO1	Develop the skills like preparation of solutions crystallization techniques	L6
CO2	Explain the techniques like Acetylation Benzylation Nitration	L2
CO3	Apply theoretical knowledge in various steps of compound preparation	L3
CO4	Identify purity of compounds	L2

COURSE: CHE -107: PHYSICAL CHEMISTRY LAB-I

CO	COURSE OUTCOMES	LEVEL
CO1	Estimate of HCL and CH ₃ COOH with standard NaOH by using conductivity meter	L2
CO2	Discriminate cell constant and dissociation constant of weak acid	L4
CO3	Estimate the CST of phenol-water system and study of the effect of impurity on miscibility temperature	L2
CO4	Evaluate the cell constant	L5

SEMESTER-II

COURSE: 201-GENERAL CHEMISTRY-II

CO	COURSE OUTCOMES	LEVEL
CO1	Understand the structure of an atom, radial and angular probability distributions and shapes of atomic orbitals.	L2
CO2	Understand the symmetry operations of any small and medium sized molecule and apply point group theory to the study of electrical, optical and magnetic properties and selection rules for absorption.	L2
CO3	Apply the conceptual understanding of the statistical parameters to the analytical data.	L3
CO4	Apply elementary programs in Fortran for performing scientific calculations	L3
CO5	Understand the structure of an atom, radial and angular probability distributions and shapes of atomic orbitals.	L2



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

COURSE: CHE: 202: INORGANIC CHEMISTRY-II

CO	COURSE OUTCOMES	LEVEL
C01	Understand the basic concepts of structure and bonding of metal clusters.	L2
C02	Explain the Preparation, structure and bonding of organo metallic compounds.	L2
C03	Estimate the methods of stability of metal complexes and bio-inorganic chemistry.	L5
C04	Differentiate types of reaction mechanisms of metal complexes and electron transfer reactions	L2
C05	Understand the basic concepts of structure and bonding of metal clusters.	L2

COURSE: CHE: 203: ORGANIC CHEMISTRY-II

CO	COURSE OUTCOMES	LEVEL
C01	Understand the types and mechanisms of elimination reactions in organic chemistry.	L2
C02	Understand the concepts of Aromatic substitution reactions ie Electrophilic, nucleophilic, radical	L2
C03	Predict insights into aliphatic nucleophilic substitution reactions	L5
C04	Identify and predict the mechanism of Name reactions	L2
C05	Estimate knowledge about spectroscopic techniques UV, IR, NMR & Mass	L5

COURSE: 204-PHYSICAL CHEMISTRY-II

CO	COURSE OUTCOMES	LEVEL
C01	Understand the fundamental principle of magnetic resonance through theory and implement them to simple examples.	L2
C02	Analyze the fundamental principles of statistical thermodynamics , their application for obtaining absolute values for thermodynamic parameters using partition functions	L4
C03	Evaluate the equations representing electrochemical cell	L5
C04	Calculate the electrochemical cell parameters and certain thermodynamic parameters using EMF data.	L3
C05	Apply the voltametry , polarization experimental technique	L3



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

COURSE: CHE: 205: INORGANIC CHEMISTRY LAB-II

CO	COURSE OUTCOMES	LEVEL
C01	Demonstrate the determination of some metal ions by using classical metals of analysis like volumetric and gravimetric methods	L3
C02	Prepare and standardise the solutions and indicators and buffer solutions	L3
C03	Estimation of quantity of some metal ions the presence of other metal ions	L5

COURSE: CHE: 206: ORGANIC CHEMISTRY LAB-II

CO	COURSE OUTCOMES	LEVEL
C01	Separation of two compounds into individual compounds by adopting solubility method	L4
C02	Identification and conformation of functional group(s) present in each of compounds	L2
C03	Preparation of one solid derivative for the conformation of each of the functional group(s)	L3

COURSE: 207- PHYSICAL CHEMISTRY LAB-II

CO	COURSE OUTCOMES	LEVEL
C01	Estimate the mixture of strong acid and weak acid vs strong base by using conductometry	L2
C02	Estimate the strong acid strong base PH-Metry	L2
C03	Demonstrate the determination of Fe ⁺² VS K ₂ Cr ₂ O ₇	L2



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

SEMESTER-III

COURSE: OCHE – 301 ORGANICREACTION MECHANISM AND PERICYCLIC REACTIONS

CO	COURSE OUTCOMES	LEVEL
CO1	Understand the concept stereochemistry and its importance.	L2
CO2	Understand the aliphatic substitution.	L2
CO3	Apply the various types of aliphatic nucleophilic substitution.	L3
CO4	Understand the aromatic substitution reaction.	L2
CO5	Understanding the activation of chemical reactions .Thermal and photochemical methods,molecular orbitals of c onjugated polyenes and their symmetry properties definition and classification of pericyclic reactions methods of analyzing pericyclic reactions	L2

COURSE: OCHE – 302 – ORGANIC SPECTROSCOPY – I

CO	COURSE OUTCOMES	LEVEL
CO1	Understand about the principle and applications of ultraviolet andWoodward Fisher Rule.	L2
CO2	Understand the Infrared spectroscopy in organic structure Determination.	L2
CO3	Discuss about the Nuclear magnetic resonance spectroscopy.Proton chemical shift, Spin – Spin coupling, coupling constants and applications to organic structures 1H and 13C resonance spectroscopy.	L2
CO4	Understand the Mass spectroscopy and its applications	L2

COURSE: OCHE- 303 -MODERN ORGANIC SYNTHESIS -I

CO	COURSE OUTCOMES	LEVEL
CO1	Identify methods to construct C-C and C=C bonds.	L2
CO2	Understand HLF, Barton and reactions of organic hypohalites for reactions at unactivated CH bonds and organo boranes.	L2
CO3	Understand various methods to protection of alcohols, 1, 2diols, carbonyl compounds, carboxylic acids and amines.	L2
CO4	Discuss PTC catalyst and crown ethers.	L2



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

COURSE: OCHE- 304- CHEMISTRY OF NATURAL PRODUCTS-I

CO	COURSE OUTCOMES	LEVEL
C01	Understand the isolation and structural determination of alkaloids	L2
C02	Apply the stereo chemistry of alkaloids	L2
C03	Understand the isolation and structural determination of flavanoids & iso –flavanoids	L2
C04	Identify the isoprene rule	L2
C05	Understand the terpenoids and its classification	L2

COURSE: OCHE305 (MULTISTEP SYNTHESIS OF ORGANIC COMPOUNDS)

CO	COURSE OUTCOMES	LEVEL
C01	Illustrate the use of organic reagents and may involve purification of the products by chromatographic techniques.	L3
C02	Prepare the rearrangements of Beckmann and Benzilic acid .	L6
C03	Preparation of the compounds like P-Bromo aniline, Tribromo Benzene, 2,4,6-trimethylquinoline, Flavone and 2-Phenylindole.	L6

COURSE: OCHE – 306 –ESTIMATIONS AND CHROMOTOGRAPHY

CO	COURSE OUTCOMES	LEVEL
C01	Use glass apparatus carefully	L3
C02	Estimate the organic compounds like Glucose, phenol, Aniline, Aspirin, Acetone, Ibuprofen and Paracetamol	L2
C03	Distinguish between ortho nitro Aniline and para nitro aniline by using column chromatography	L4
C04	Calculate the normalities for organic compounds and their molecular weight	L3



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

SEMESTER-III

COURSE: ACHE- 301: SEPARATION METHODS-I

CO	COURSE OUTCOMES	LEVEL
CO1	Understand the separation of compounds by chromatographic techniques.	L2
CO2	Explain instrumentation, separation & identification by Column chromatography, Gel exclusion chromatography & Electrophoresis techniques.	L2
CO3	Explain theory, instrumentation of Gas chromatography & GC-MS & Inorganic molecular sieves.	L2
CO4	Explain theory & instrumentation of HPLC & LC-MS.	L2
CO5	Understand applications of various chromatographic techniques for organic, inorganic & natural products	L2

COURSE: ACHE-302: QUALITY CONTROL & TRADITIONAL METHODS OF ANALYSIS-I

CO	COURSE OUTCOMES	LEVEL
CO1	Understand the quality control & quality assurance, ISO series, GLP, ICH guidelines.	L2
CO2	Understand the decomposition and dissolution of samples	L2
CO3	Understand & practice about analytical chemistry of some selected oxidant systems.	L2
CO4	Estimate the organic functional group analysis	L2

COURSE: ACHE-303: APPLIED ANALYSIS-I

CO	COURSE OUTCOMES	LEVEL
CO1	Analyze the different types of Ores to examine constituents.	L4
CO2	Analyze the different finished products like soaps, oils and paints.	L4
CO3	Understand the finished products like cement, fireclay, blast furnace slag, dolomite and limestone.	L2
CO4	Explain the assessment of water quality.	L2



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

COURSE: ACHE- 304: INSTRUMENTAL METHODS OF ANALYSIS-I

CO	COURSE OUTCOMES	LEVEL
C01	Explain the theoretical principles and instrumentation of UV spectroscopy and spectrofluorimetry	L2
C02	Understand the theory and instrumentation of IR and Raman Spectroscopy.	L2
C03	Explain theory and instrumentation of NMR and ESR spectroscopy.	L2
C04	Understand principle and instrumentation of Mass and X-RF spectroscopy.	L2
C05	Understand applications of various instrumental methods	L2

COURSE: ACHE- 305: CLASSICAL METHODS OF ANALYSIS-I

CO	COURSE OUTCOMES	LEVEL
C01	Predict the total hardness, chloride and DO of water samples	L5
C02	Estimate the Calcium and Magnesium using complexometric titrations	L2
C03	Estimate Ammonia and Phosphate from fertilizers	L2
C04	Analyze the Iron ore sample	L4
C05	Analyze the moisture content, volatile matter, fixed carbon and ash content of coal sample.	L4

COURSE: ACHE- 306: INSTRUMENTAL METHODS OF ANALYSIS-I

CO	COURSE OUTCOMES	LEVEL
C01	Estimate the purity of commercial HCl and H ₂ SO ₄ using PH metric titrations	L2
C02	Estimate the Cr (VI), Fe(II), Ce(IV) and V(V) using potentiometric end point	L2
C03	Estimate the Iron, Phosphate and Mn(II) using spectrophotometry	L2
C04	Estimation of sodium and potassium in given samples	L2
C05	Predict the R _f values and identification of Organic compounds in a given mixture by TLC.	L4



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

SEMESTER-IV

COURSE: OCHE- 401-ORGANIC REACTION MECHANISM AND ORGANIC PHOTO CHEMISTRY

CO	COURSE OUTCOMES	LEVEL
CO1	Understand nucleophilic aromatic substitution reaction.	L2
CO2	Understand Neighbouring group participation in aliphatic electrophilic substitution.	L2
CO3	Understand Photochemistry of Carbonyl compounds.	L2
CO4	Understand photo chemistry of olefins, Aromatic compounds.	L2
CO5	Understand Norrish type –I, Norrish type –II, reactions, Paterno-Buchi reactions	L2

COURSE: OCHE – 402 – ORGANIC SPECTROSCOPY – I

CO	COURSE OUTCOMES	LEVEL
CO1	Understand the basic concepts of conformational analysis of cyclic systems and applications of Optical Rotatory Dispersion.	L2
CO2	Understand the basic principles of ¹³ C- spectroscopy and to apply for structural elucidation	L2
CO3	Understand the methods of characterizing compounds by 2D NMR techniques	L2
CO4	apply these spectroscopic techniques for the determination of structure of organic molecules.	L2
CO5	Understand the various methods of separations like thin layer chromatography, High performance thin layer chromatography, Gas-liquid Chromatography and columns packing	L2



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

COURSE: OCHE -403- MODERN ORGANIC SYNTHESSES- II

CO	COURSE OUTCOMES	LEVEL
C01	Identify organosilanes for the formation of various organic compounds.	L2
C02	Discuss on linear and convergent synthesis in retrosynthesis to identify the reverse path for the synthesis of target molecule.	L2
C03	Illustrates different oxidizing agents for oxidation of alkanes, alkenes, alcohols and carbonyl compounds.	L3
C04	Discuss various oxidizing agents such as KMnO ₄ , OsO ₄ , HIO ₄ , Lead tetra acetate, CrO ₃ and SeO ₃ to identify proper method to oxidize a particular functional group.	L3
C05	Discuss different reducing methods for formation of desired functional groups	L3

COURSE: OCHE – 404: BIO- ORGANIC CHEMISTRY-II

CO	COURSE OUTCOMES	LEVEL
C01	Understand the complexity of biological reactions in a living organisms	L2
C02	Apply the DNA structure, transfer of genetic information from one generation to another generation.	L3
C03	Analyze various pathways like ATP, role of various enzymes , role of Amino acids and proteins	L4
C04	Explain the role of vitamins , advantage and disadvantages in a living organism	L2
C05	Understand the metabolic process in all living organism	L2



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

COURSE: OCHE405 (CHROMATOGRAPHIC SEPARATION AND ISOLATION & IDENTIFICATION OF NATURAL PRODUCTS)

CO	COURSE OUTCOMES	LEVEL
CO1	Identify the purity of given sample by using thin layer chromatography	L2
CO2	Identification of unknown organic compounds by comparing the R _f values of known standards	L2
CO3	Isolation and identification of different drugs from natural products	L2

COURSE: OCHE – 406- SPECTRAL IDENTIFICATION OF ORGANIC COMPOUNDS

CO	COURSE OUTCOMES	LEVEL
CO1	Discuss about UV spectra to know absorption maximum value whether the compound is saturated (or) unsaturated transition	L2
CO2	Discuss about IR spectra to know the functional group	L2
CO3	Discuss about PMR and CMR spectra to know about proton and carbon environment	L2
CO4	Discuss about Mass spectra to know about their molecular weight and molecular formula	L2

COURSE: OCHE – 407- PROJECT

CO	COURSE OUTCOMES	LEVEL
CO1	Demonstrating the ability to design, execute and analyze experiments independently or as part of a team	L2
CO2	Developing the capacity to evaluate scientific literature, identify gaps in knowledge and propose innovative research questions	L5
CO3	Effectively presenting research findings through written reports, oral presentation and possibly publications in scientific journals	L2
CO4	Addressing challenges encountered during research, adapting experimental protocols and troubleshooting equipment or experimental setups	L3



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

SEMESTER-IV

COURSE: ACHE-401: SEPARATION METHODS-II

CO	COURSE OUTCOMES	LEVEL
CO1	Understand the theoretical & practical concepts of paper & thin layer chromatography.	L2
CO2	Explain theory, instrumentation of ion exchange & ion exchange chromatography & ion chromatography.	L2
CO3	Understand the theory of sampling of solids, liquids & gases.	L2
CO4	Understand the principle, classification of separation methods using solvent extraction.	L2
CO5	Understand the importance of analytical chemistry to industrial research.	L2

COURSE: ACHE- 402: TRADITIONAL METHODS OF ANALYSIS-II

CO	COURSE OUTCOMES	LEVEL
CO1	Explain co-precipitation, post precipitation and precipitation titrations.	L2
CO2	Understand the concepts of precipitation from Homogeneous solution (PFHS) and Electrogravimetry	L2
CO3	Understand & practice about analytical chemistry of some selected reductant systems.	L2
CO4	Analyze the different types of drugs.	L4

COURSE: ACHE-403: APPLIED ANALYSIS-II

CO	COURSE OUTCOMES	LEVEL
CO1	Analyze the ferrous and non ferrous alloys.	L4
CO2	Understand the analysis of soil, fertilizers and fuels.	L2
CO3	Describe the different pollutants and their estimations in air quality.	L2
CO4	Explain the kinetic methods of analysis and non aqueous titrimetry	L2



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

COURSE: ACHE- 404: INSTRUMENTAL METHODS OF ANALYSIS-II

CO	COURSE OUTCOMES	LEVEL
C01	Explain the theoretical principles and instrumentation of Flame photometer, Atomic absorption spectroscopy, ICP-AES and ICP-MS	L2
C02	Understand the theory and instrumentation of Thermogravimetry Differential thermal analysis and differential scanning calorimetry.	L2
C03	Explain theory and instrumentation of DME stripping voltammetry and coulometry.	L2
C04	Understand the determination of ions using different ion selective electrodes and radio chemical methods.	L2
C05	Understand applications of various instrumental methods for organic, inorganic and natural products.	L2

COURSE: ACHE- 405: CLASSICAL METHODS OF ANALYSIS-II

CO	COURSE OUTCOMES	LEVEL
C01	Predict the alkalinity, COD and BOD of water samples	L2
C02	Estimate the Iron using redox titrations	L5
C03	Estimate Nitrate and Sulfur from fertilizers	L5
C04	Evaluate the saponification value, acid value of oil samples	L5
C05	Separate and determination of ions by ion exchanger resins	L4

COURSE: ACHE- 406: INSTRUMENTAL METHODS OF ANALYSIS-II

CO	COURSE OUTCOMES	LEVEL
C01	Estimate the purity of commercial H ₃ PO ₄ and CH ₃ COOH using P ^H metric titrations	L2
C02	Estimate the Mn(VII), Fe(II), and V(V) using potentiometric end point	L2
C03	Estimate the Nitrate and Nitrite using spectrophotometry	L2
C04	Estimation of Lithium and Calcium in given samples	L2
C05	Predict the Organic compounds in a given mixture by TLC.	L4



DANTULURI NARAYANA RAJU COLLEGE

(Autonomous)

BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.

(Accredited at 'B⁺⁺' level by NAAC)

(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

COURSE: ACHE – 407- PROJECT

CO	COURSE OUTCOMES	LEVEL
C01	Demonstrating the ability to design, execute and analyze experiments independently or as part of a team	L2
C02	Developing the capacity to evaluate scientific literature, identify gaps in knowledge and propose innovative research questions	L5
C03	Effectively presenting research findings through written reports, oral presentation and possibly publications in scientific journals	L2
C04	Addressing challenges encountered during research, adapting experimental protocols and troubleshooting equipment or experimental setups	L3