Department: Chemistry

2020-21

Programme Specific Outcomes (PSO)

PSO 1: Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Inorganic, Organic and Physical Chemistry subjects. Students will be able to describe the fundamental scientific principles in the subfields of chemistry (analytical, inorganic, organic and physical), and apply these principles to problems. They are able to explain, integrate and apply relevant knowledge to problems that emerge from the broader interdisciplinary subfields (life, environmental and materials sciences).

PSO 2: An understanding of major concepts, theoretical principles and experimental findings in chemistry. With guidance, students will be able to apply the methodologies in order to conduct chemical syntheses, analyses or other chemical investigations and obtain information from library, online and literature resources that will support the solving of chemical and research problems.

PSO 3: Students will be able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments. Students will bee able to use chemical knowledge to predict and rationalize properties, mechanisms and patterns of reactivity. They will be able to prepare logical, organized and concise written reports, and oral and poster presentations that effectively communicate chemical content to other scientists. Also they will be able to field questions pertaining to chemical theory, research experimental design and data interpretation.

PSO 4: Recognize assumptions and limitations in the scientific models and simulations, and propose their possible impact on the results.

PSO 5: Evaluate the accuracy of, and the sources of errors in, experimental measurements. Be able to work productively and collaboratively as a team member.

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Programme Outcome (PO)

	Program Outcome	Description
PO1	**Subject Knowledge**	This course helps students to attain the basic understandings in the theoretical and practical feature of Chemistry
	Method of Measurement:	**Internal Assessment**
PO2	**Critical thinking**	Upon completion of the chemistry course, majors are able to recognize and apply the principles of atomic and molecular structure to predict chemical properties and chemical reactivity. Upon completion of a chemistry degree, chemistry majors are able to interpret and analyze quantitative data.
	Method of Measurement:	**Continuous Internal Assessment**
PO3	**Effective communication**	Communicating about chemistry has the potential to raise public interest and understanding of chemistry around the world. Chemistry communication presents a framework to use in the design, implementation and evaluation of their public communication efforts.
	Method of Measurement:	**Regular Student-Teacher Interaction**
PO4	**Social Interaction**	Be able to identify and describe the underlying principles behind chemical techniques relevant to academia, industry and government
	Method of Measurement:	**Regular Presentation Seminars**
PO5	**Ethics**	Students will appreciate the central role of chemistry in our society and use this as a basis for ethical behaviour in issues facing chemists including an understanding of safe handling of chemicals, environmental issues and key issues facing our

		society in energy, health and medicine.
	Method of Measurement:	**Regular Student-Teacher Interaction**
PO6	**Laboratory Skills and Instrumentation**	Upon completion of a degree, chemistry majors are able to employ scientific thinking and inquiry in the performance, design, interpretation and documentation of laboratory experiments, at a level suitable to succeed at an entry-level position in chemical industry or a chemistry graduate program. They are able to understand theoretical concepts of instruments that are commonly used in most chemistry fields as well as interpret and use data generated in instrumental chemical analyses.
	Method of Measurement:	**Continuous Practical Assignments**
PO7	**Environment and Sustainability**	Chemistry is crucial to finding sustainable solutions to far-reaching challenges, including: Energy provision, Environmental protection, Food and water safety, Global healthcare and explore the resources to learn more about chemistry's role in sustainability.
	Method of Measurement:	**Regular Student-Teacher Interaction**
PO8	**Self-directed and life-long learning**	The role of chemistry acquires flexible knowledge and problem solving skills to facilitate the expected development of our modern society. This area helps B.Sc. chemistry graduates to communicate the concept and results of laboratory experiments through effective independent writing and oral communication skills.
	Method of Measurement:	**Student-Teacher Interaction on Research Topics**

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Course Outcome (CO)

Subject: Chemistry (Honours) 2020-2021	
Paper	**Course Outcome**
Semester 1	
CEMA-CC-1-1-TH	
INORGANIC CHEMISTRY-1 Extra nuclear Structure of atom, Acid-base reactions and redox reactions	**COCC1.1:** This portion describes the structure of the atom.
	COCC1.2: Elementary idea of acid-base chemistry It describes the difference(s) between strong acids/bases and weak acids/bases which leads to Arrhenius theory, Bronsted-Lowry theory, and Lewis theory.
	COCC1.3: Redox reaction: It gives the idea on an oxidation – reduction (redox) reaction based on changes in oxidation numbers across the chemical change and what factors influence on it.
ORGANIC CHEMISTRY- 1A Basics of Organic Chemistry	**COCC1.4:** It gives the idea of spatial arrangement, properties, reactivity, hybridization and structure of organic molecules, Basic idea about Molecular Orbital Theory (MOT) and reaction mechanism, An understanding of nucleophiles, electrophiles, electronegativity, and resonance.
CEMA-CC-1-1-P	
INORGANIC CHEMISTRY-I (1) LAB Acid and Base Titrations Oxidation-Reduction Titrations **ORGANIC CHEMISTRY -O- (1A) LAB** Separation of solid mixture	**COCC1.5:** It gives the idea about primary and secondary substances and quantitative titrations. **COCC1.6:** It helps to develop the hand-on skill to determine the nature of the organic compounds on the basis of acid-base treatment.
CEMA-CC-1-2-TH	
PHYSICAL CHEMISTRY-1 Kinetic theory and gaseous state, Transport processes, Chemical kinetics	**COCC2.1:** It gives the idea of ideal and real gases, kinetic energy and its variation of temperature and pressure.
	COCC2.2: It deals with diffusion and Viscosity of liquids, Poiseuille's equation with derivation.
	COCC2.3: Discussion of Rate law, order and molecularity, role of temperature on kinetics, Homogeneous catalysis
ORGANIC CHEMISTRY - 1B Stereochemistry	**COCC2.4:** It gives the basic idea ofthree diamensional arrangements of the molecules, their stereochemical features, idea of stereoisomerism (enantiomerism, diastereoisomerism) and the basic idea of resolution and recimisation.
PHYSICAL CHEMISTRY-P(1) LAB Physical Experiments	**COCC2.5:** Calibration of the apparatus like volumetric flask, pipette and burette, preparation of standard solutions and standardization, understanding of the determination of equivalent weight, surface tension, viscosity of a liquid,

	kinetics experiments and experiment on solubility etc.
ORGANIC CHEMISTRY – O (1B) LAB Determination of boiling point of liquid	**COCC2.6:** It helps to develop laboratory training to use melting point and boiling apparatuses.
Semester 2	
CEMA-CC-2-3-TH	
ORGANIC CHEMISTRY -2 Stereochemistry II General Treatment of Reaction Mechanism III	**COCC3.1:** Advanced idea of stereochemistry leads to axial chirality, topicity, prochirality etc. and the conformational analysis of the molecules.
	COCC3.2: Idea of reaction thermodynamics, acid-base equilibria and tautomerism. Basic concept of reaction kinetics includes kinetic isotope effect and KCP vs TCP.
	COCC3.3: Detailed discussion of nucleophilic substitution (S_N1, S_N2) along with NGP and S_N^i.
	COCC3.4: Stereochemical and regiochemical outcome of elimination (E1, E2, E1CB) reactions.
CEMA-CC-2-3-P	
Organic Preparations	**COCC3.5:** The basic skill of organic synthesis through the preparation methodology.
CEMA-CC-2-4-TH	
INORGANIC CHEMISTRY-2 Chemical Bonding-I Chemical Bonding-II Radioactivity	**COCC4.1:** This portion gives the idea about differentiate between ionic and covalent bonding, classify the bonding in a compound and helps us the information about shape of molecule, its hybridization and reactivity.
	COCC4.2: It gives the knowledge about atomic orbitals and molecular orbitals.
	COCC4.3: It gives the idea about fundamental concepts e.g. half-life, radioactive series and isotope generators.
CEMA-CC-2-4-P	
Iodo-/ Iodimetric Titrations Estimation of metal content in some selective samples	**COCC4.4:** Learn how to estimate the metal content in alloy or ores and develop the skill of iodometric titrations. It gives the knowledge about Iodo-/Iodimetric titrations and learns how to estimate the metal content in alloy or ores and develop the skill of iodometric titrations.
Semester 3	
CEMA-CC-3-5-TH	
PHYSICAL CHEMISTRY-2 Chemical Thermodynamics Applications of Thermodynamics – I Electrochemistry	**COCC5.1:** It deals with laws of thermodynamics, concept of heat and work, enthalpy, internal energy, entropy, free energy, work functions, and spontaneity of the reaction, Concept of open system and fugacity , activity
	COCC5.2: Advanced concept of chemical and thermodynamic equilibrium and Le Chatelier's principle.

	COCC5.3: It s with fundamentals of electrochemistry, recognize the electrochemical processes, Conductance and its measurement, Ionic equilibrium and degree of ionization, explain types of electrodes, express the Nernst equation, discuss electrode potentials and cell thermodynamics
CEMA-CC-3-5-P	
Physical Experiments	**COCC5.4:** Understand the determination of ionisation constant of weak acid, strength of unknown acid conductometrically, solubility product potentiometrically and heat of neutralization of a strong acid by a strong base
CEMA-CC-3-6-TH	
INORGANIC CHEMISTRY-3 Chemical periodicity, Chemistry of s and p Block Elements, Coordination Chemistry-I	**COCC6.1:** This portion gives the idea of chemical periodicity; chemists generally understand that chemical elements can be grouped together in separate classes according to obvious similarities or dissimilarities in their properties.
	COCC6.2: It explains the atomic structure, the chemical and the physical properties of main group elements.
	COCC6.3: It gives the preliminary ideas about coordination compounds.
CEMA-CC-3-6-P	
Complexometric titration Chromatography of metal ions Gravimetry	**COCC6.4:** Students are able to develop the skill of complexometry, chromatography and gravimetry experiments.
CEMA-CC-3-7-TH	
ORGANIC CHEMISTRY -3 Chemistry of alkenes and alkynes Aromatic Substitution Reaction Carbonyl and Related Compounds Organometallics	**COCC7.1:** This course helps to develop the idea of electrophilic addition to olefinic and acetylenic carbon-carbon bonds, regioselectivity of addition, functionalisation and downstream exploitation of unsaturated compounds.
	COCC7.2: It discuss the details of functionalizing the ubiquitous benzene ring, attack of electrophiles and nucleophiles, substituents' directing ability, accessing highly functionalized aryl targets.
	COCC7.3: Learn to exploit the synthetic potential of the carbonyl group, its electrophilic and nucleophilic character, formation of carbon-carbon bonds utilizing aldol and related reactions.
	COCC7.4: It gives the concept of reversal of polarity, construction of carbon-carbon bonds using nucleophilic carbon reagents, base-nucleophile dichotomy in different organometallics like organozinc, organolithium, organocopper and organomagnesiums.
CEMA-CC-3-7-P	
Practical: **A.** Identification of a Pure Organic Compound	**COCC7.5:** A. Qualitative organic analysis (QOA) has served as a valuable tool for young learners to develop analytical and laboratory skills.

B. Quantitative Estimations	B. Predict the results and identify errors associated with a chemical analysis based on the analytical technique and nature of the sample and evaluate experimental data.
Skill Enhancement Course SEC-A2	
ANALYTICAL CLINICAL BIOCHEMISTRY *Carbohydrates, Proteins, Enzymes, Lipoproteins* Biochemistry of disease: A diagnostic approach by blood/ urine analysis	**COSECA2.1:** Basic ideas about structures of biopolymers and their function in human body.
	COSECA2.2: Idea about enzyme catalysis in various biological processes, kinetics of enzyme catalysis.
	COSECA2.3: Theoretical background to the estimation techniques and tests of constituents of human urine and blood samples.
Hands On Practical Identification and estimation	**COSECA2.4:** It helps to develop the pathological concept and laboratory skill how to estimate urine and blood sample.
Semester 4	
CEMA-CC-4-8-TH	
ORGANIC CHEMISTRY -4 Nitrogen compounds Rearrangements The Logic of Organic Synthesis Organic Spectroscopy	**COCC8.1:** Chemistry of amines, nitro, diazo compounds, exploration into the realm of carbon-nitrogen bond, synthetic potential of organonitrogen compounds, their importance.
	COCC8.2: Introduction to rearrangement reactions in organic chemistry and their importance in organic synthesis.
	COCC8.3: Develop the skill for the art of synthesis in organic chemistry, retrosynthetic analysis, concept of disconnection and synthons, analysis and forward synthesis plans, the concept of protecting groups, basics of stereoselective synthesis.
	COCC8.4: Discuss about the Spectroscopic techniques as a characterization and identification tool in organic chemistry – UV, IR and NMR spectroscopy.
CEMA-CC-4-8-P	
Qualitative Analysis of Single Solid Organic Compounds	**COCC8.5:** Critically evaluate the advantages and disadvantages of a variety of qualitative analysis methods and understanding the characteristics, roles and importance of qualitative research.
Skill Enhancement Course SEC-B3	
PHARMACEUTICALS CHEMISTRY Drugs & Pharmaceuticals Fermentation	**COSECB3.1:** Concept of medicinal chemistry and the history of drug discovery leads to structure-activity relationship.
	COSECB3.2: Basic idea about the Retrosynthetic analysis and forward synthesis of drugs of different kind.
	COSECB3.3: Fermentation techniques for common commercial products.
Hands On Practical Preparation of Drugs	**COSECB3.4:** Develop the basic hands-on laboratory skill of organic synthesis through the preparation of drug molecule.

CEMA-CC-4-9-TH	
PHYSICAL CHEMISTRY 3 Application of Thermodynamics, Foundation of Quantum Mechanics, Crystal Structure	**COCC9.1:** It deals with Colligative properties and Phase equilibrium, discuss Ideal solutions and Raoult's law, explain phase, component and degrees of freedom, express Phase rule and phase diagram.
	COCC9.2: It s with foundation of Quantum mechanics, Wave function, Schrodinger time-independent equation, elementary concepts of operators and eigen functions, understanding of particle in a box problem.
	COCC9.3: It deals with Crystal structure of solid, laws of crystallography, Miller indices, Bragg's law and specific heat of solid.
CEMA-CC-4-9-P	
Physical Experiments	**COCC9.4:** Understanding of pH-metric titration, Study of Phase diagram, determination of partition coefficient and Kinetic study Polarimetrically
CEMA-CC-4-10-TH	
INORGANIC CHEMISTRY-4 Coordination Chemistry-II Chemistry of d- and f- block elements Reaction Kinetics and Mechanism	**COCC10.1:** It discusses the relationships between ligand binding in a metal complex and the degeneracy of the d orbitals and between the geometry of a metal complex and the splitting of the d orbitals.
	COCC10.2: Also, with the help of the said bonding it helps to explain the color and magnetism of coordination compounds.
	COCC10.3: It gives the knowledge about atomic radii, ionization energy and oxidation state of d- and f- block elements.
	COCC10.4: It provides to identify the reaction order for a chemical change.
CEMA-CC-4-10-P	
Inorganic preparations and 10 Dq calculations	**COCC10.5:** Students will be able to synthesize and carry out scientific experiments as well as accurately record and analyze the results of such experiments.
Semester 5	
CEMA-CC-5-11-TH	
PHYSICAL CHEMISTRY – 4 Quantum Chemistry II, Statistical Thermodynamics, Numerical Analysis	**COCC11.1:** Its deal with Simple Harmonic Oscillator, Angular momentum, Hydrogen atom and hydrogen-like ions and LCAO method
	COCC11.2: Its deal with Statistical Thermodynamics, Configuration, equilibrium configuration, understanding of Boltzmann distribution, Partition function and Adiabatic demagnetization
	COCC11.3: Its deal with Numerical Analysis, Roots of equation,

	discussion of Quadratic formula, Iterative methods, Numerical differentiation and Numerical integration
CEMA-CC-5-11-P	
PHYSICAL CHEMISTRY-4 Physical Experiments	**CO CC11.4:** learning of Computer programming (Using FORTRAN) based on numerical methods, Determination of roots of equations, numerical differentiation and numerical integration
CEMA-CC-5-12-TH	
ORGANIC CHEMISTRY -5 Carbocyles and Heterocycles Cyclic Stereochemistry Pericyclic reactions Carbohydrates Biomolecules	**COCC12.1:** Gathered the information about the importance of polynuclear hydrocarbons and heterocyclic compounds containing one heteroatom, their synthesis and reactions.
	COCC12.2: This course delas with the Conformational analysis of cyclohexane ring systems, case studies regarding substitution, elimination, rearrangement and oxidation reactions of cyclohexyl substrates.
	COCC12.3: Helps to develop the self-onfidence about the FMO analysis and synthetic importance of the three fundamental pericyclic processes – cycloaddition, electrocyclic reaction and sigmatropic rearrangements.
	COCC12.4: It gives the information of glycochemistry - reactions and stereochemistry of monosaccharides up to hexoses, introduction to disaccharides.
	COCC12.5: Gathered the detail concept of Proteins and peptides – amino acids and their chemistry, formation of peptide bonds, structural hierarchy of proteins and their functions.
CEMA-CC-5-12-P	
Practical: A. Chromatographic Separations B. B. Spectroscopic Analysis of Organic Compounds	**COCC12.6:** A. Learn about the basic theory of chromatography and hands-on training to set the column for chromatographic separations. B. Develop the analytical skill to analyse the unknown IR, NMR spectra of organic compounds. Discuss structural elucidation of organic compounds by IR, NMR spectral data.
Discipline Specific Elective –DSE-A2-TH	
APPLICATIONS OF COMPUTERS IN CHEMISTRY	**CODSEA2.1:** It deals with Computer Programming Basics (FORTRAN), Introduction to Spreadsheet Software (MS Excel), SOLVER functions, excel Goal Seek function, discussion of Statistical analysis
Discipline Specific Elective –DSE-A2-P	
APPLICATIONS OF COMPUTERS IN CHEMISTRY	**CODSEA2.2:** Plotting of Graphs using a spreadsheet, acid-base titration curve using excel Goal Seek function, Understanding of SOLVER and LINEST functions
Discipline Specific Elective –DSE-B1-TH	
Inorganic materials of Industrial importance	**CODSEB1.1:** It gives the idea about various structures of silicates, the properties of glass and quartz.
	CODSEB1.2: Students will be able to recognize several types of fertilizers and to interpret the N-P-K analysis of a fertilizer product.

	CODSEB1.3: Student should be able to understand the purpose and major steps involved of surface coating.
	CODSEB1.4: It explains composition, properties, and applications of Low alloy, High Speed Steel alloy, stainless steel, and commercial quality steels.
	CODSEB1.5: It defines the principles and mechanisms of catalysis and applications of homogenous and heterogenous catalysis.
	CODSEB1.6: It describes the characteristics of explosions and explosives, and describe the main causes of the destructive power of chemical explosives.
Discipline Specific Elective –DSE-B1-P	
Inorganic materials of Industrial importance	**CODSEB1.7:** Students will able to characterize fertilizers on the basis of different properties.
	CODSEB1.8: Students will able to investigate the % of metal in alloy.
	CODSEB1.9: Students will able to study of composition of cement.
Semester 6	
CEMA-CC-6-13-TH	
INORGANIC CHEMISTRY-5 Theoretical Principles in Qualitative Analysis Bioinorganic Chemistry Organometallic Chemistry Catalysis by Organometallic Compounds	**COCC13.1:** Students will learn about the chemistry of organometalic compounds, homogenous hydrogenation and carbonyls. **COCC13.2:** Students will understand the biological significance of sodium, potassium, magnesium and calcium and able to recognize the biological reaction alkali and alkaline earth metals, nitrogen fixation, hemoglobin and myoglobin. **COCC13.3:** To gain the knowledge of catalyst characteristics, mechanism of catalytic reactions, and design of catalytic reactors.
CEMA-CC-6-13-P	
Qualitative Semimicro Analysis	**COCC13.4:** It describes a method of analytical chemistry which seeks to find the elemental composition of inorganic compounds.
CEMA-CC-6-14-TH	
PHYSICAL CHEMISTRY-5 Molecular Spectroscopy Photochemistry and Theory of reaction rate Surface phenomenon Adsorption Colloids Dipole moment and polarizability	**COCC14.1:** To recognize spectroscopy in microwave, Rotational spectra of rigid diatomic molecules, selection rules, interaction of spectral lines and its application. **COCC14.2:** To gain the knowledge of theory and practice of common photochemical and photophysical methods, and be able to execute these experimentally. **COCC14.3:** To provide basic knowledge of surface- and colloid chemistry from a physical-chemical perspective. **COCC14.4:** Student will learn about determining the permanent dipole moments of some polar molecules in a non-polar solvent based on Debye's theory and the Guggenheim approximation.

	CEMA-CC-6-14-P
Physical experiments	**COCC14.5:** Students will learn the molar extinction coefficient of fluorophore. **COCC14.6:** From Tensiometry measurement students will learn about CMC.
Discipline Specific Elective–DSE-B-3	
POLYMER CHEMISTRY	**CO DSE-B-3.1:** Students will be able to understand the relationships between polymer molecular weight, molecular weight distribution, and the properties of polymeric materials. **CODSE-B-3.2:** Students will be able to determine polymer molecular weights and molecular weight distributions from different types of experiments. **CODSE-B-3.3:** Students will demonstrate an ability to distinguish different polymerization reactions and their mechanisms/kinetics, and learn how actual polymerization is performed in the laboratory. **CODSE-B-3.4:** Students will learn about preparation, structure and properties of polymers
Discipline Specific Elective–DSE-A-3	
GREEN CHEMISTRY	**CODSE-A-3.1:** Students will learn how to reduce waste material, biproducs **CODSE-A-3.2:** To design the synthetic process where minimum amount of waste material to be formed. **CODSE-A-3.3:** Students will be able to understand the less hazards, less polluting materials **CODSE-A-3.4:** Students will learn about alternative source of energy, use of green sovents e.g., water, super conducting water and carbon di oxide, ionic liquids, PEG.

Department: Chemistry
2020-21
PO AND CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
COCC1.1.	√	√		√				
COCC1.2.	√	√						√
COCC1.3.	√	√		√				
COCC1.4.	√					√		√
COCC1.5.	√	√	√			√	√	√
COCC1.6.	√	√	√			√	√	√
COCC2.1.	√		√	√				
COCC2.2.	√		√	√				
COCC2.3.	√		√	√				
COCC2.4.	√	√			√	√	√	√
COCC2.5.	√	√			√	√	√	√
COCC2.6.	√	√			√	√	√	√
COCC3.1.	√		√	√	√			
COCC3.2.	√		√	√	√			
COCC3.3.	√		√	√	√			
COCC3.4.	√	√				√	√	√
COCC3.5.	√	√				√	√	√
COCC4.1.	√	√	√					√
COCC4.2.	√	√	√					√
COCC4.3.	√	√	√	√	√		√	
COCC4.4.	√				√	√		√
COCC5.1.	√	√	√	√			√	√
COCC5.2.	√	√						√
COCC5.3.	√	√		√		√		
COCC5.4.	√	√	√	√			√	√
COCC6.1.	√	√		√				√
COCC6.2.	√	√	√	√	√		√	
COCC6.3.	√	√	√					
COCC6.4.	√	√				√	√	√
COCC7.1.	√	√		√				√
COCC7.2.	√	√	√	√	√		√	
COCC7.3.	√	√	√					
COCC7.4.	√	√				√	√	√
COCC7.5.	√	√		√				√
COCCSECA2.1.	√	√	√	√	√		√	
COCCSECA2.2.	√	√	√					
COCCSECA2.3.	√	√				√	√	√
COCCSECA2.4.	√	√	√	√	√		√	
COCC8.1.	√	√	√	√			√	√

COCC8.2.	√	√						
COCC8.3.	√	√				√		
COCC8.4.	√	√	√	√			√	√
COCC8.5.	√	√		√				√
COCCSECB3.1.	√					√		√
COCCSEC B3.2.	√	√	√			√	√	√
COCCSEC B3.3.	√	√	√			√	√	√
COCCSEC B3.4.	√		√	√				
COCC9.1	√		√	√				
COCC9.2	√	√						
COCC9.3	√	√						
COCC9.4	√	√				√	√	
COCC10.1.	√	√		√				√
COCC10.2.	√	√	√	√				√
COCC10.3.	√	√					√	
COCC10.4.	√	√			√			√
COCC10.5.	√	√	√			√		√
COCC11.1	√	√						
COCC11.2	√	√						
COCC11.3	√	√						
COCC11.4	√	√				√		√
COCC12.1.	√	√		√				√
COCC12.2.	√	√	√	√				√
COCC12.3.	√	√					√	
COCC12.4.	√	√			√			√
COCC12.5.	√	√	√			√		√
COCC12.6.	√	√	√			√		√
CODSEA2.1	√	√						
CODSEA2.2	√	√				√		√
CODSEB1.1.	√	√	√	√	√		√	√
CODSEB1.2.	√	√	√	√	√		√	√
CODSEB1.3.	√	√	√	√	√		√	√
CODSEB1.4.	√	√	√	√	√		√	√
CODSEB1.5.	√	√	√	√	√		√	√
CODSEB1.6.	√	√	√	√	√		√	√
CODSEB1.7.	√	√	√	√	√	√	√	√
CODSEB1.8.	√	√	√	√	√	√	√	√
CODSEB1.9.	√	√	√	√	√	√	√	√
COCC13.1	√	√	√	√			√	
COCC13.2	√	√	√	√	√		√	√
COCC13.3	√	√	√	√	√		√	
COCC13.4	√	√		√	√	√		√
COCC14.1	√	√	√	√	√			√

COCC14.2	√	√		√	√		√	√
COCC14.3	√	√	√	√	√		√	√
COCC14.4	√	√		√	√			√
COCC14.5	√	√	√	√	√	√		√
COCC14.6	√	√	√	√	√	√	√	√
CO DSE-B-3.1	√	√		√	√			√
CO DSE-B-3.2	√	√	√	√	√			√
CO DSE-B-3.3	√	√	√	√	√			√
CO DSE-B-3.4	√	√	√	√	√		√	√
CODSE-A-3.1	√	√	√	√	√		√	√
CODSE-A-3.2	√	√	√	√	√		√	√
CODSE-A-3.3	√	√	√	√	√	√	√	√
CODSE-A-3.4	√	√	√	√	√	√	√	√