

# Scheme of work

For each VTCT (ITEC) qualification, the lecturer/centre must complete a scheme of work for each unit indicating how the Lecturer is planning to cover the unit content throughout the course. Set out the planned sessions in terms of learning outcomes to be achieved. These should match those stated within the VTCT (ITEC) unit specification. Include all units of each course offered. Hours should meet the minimum guided learning hours listed within the unit specification.

**Unit title:** iUCO65 – Chemistry of hair and beauty products

**Total contact tuition hours proposed:** 75

**Lecturer(s) responsible:**

Learning objectives	Lecture content	Suggested resources	Approx. hours
Introductory session	<ul style="list-style-type: none"> <li>College rules and regulations</li> <li>College mission statement</li> <li>VTCT (ITEC) rules and regulations</li> <li>Health &amp; safety</li> <li>Timetable</li> <li>Dates – holidays etc.</li> <li>Syllabus</li> <li>Recommended books</li> <li>Uniform</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Q&amp;A</li> <li>Using all the documents listed to ensure the students understand the college expectations and their commitment to the course</li> </ul>	

LO1 Understand the chemistry of active ingredients in hair and beauty products			
1.1. Explain the differences between chemical compounds found in hair and beauty products	<ul style="list-style-type: none"> <li>Matter</li> <li>Element</li> <li>Atom</li> <li>Nucleus</li> <li>Protons</li> <li>Neutrons</li> <li>Electrons</li> <li>Ions</li> <li>Anions</li> <li>Cations</li> <li>Molecules</li> </ul>	<ul style="list-style-type: none"> <li>OHP/Whiteboard</li> <li>Lecture</li> <li>Q&amp;A</li> <li>Homework</li> <li>Test</li> </ul>	20

	<ul style="list-style-type: none"> <li>• Covalent bonding</li> <li>• Compound</li> <li>• Mixture</li> <li>• Solution</li> <li>• Solvent</li> <li>• Solute</li> <li>• Bases</li> </ul>		
1.2. Explain the chemical processes that occur in ingredients found in hair and beauty products and their effects on the hair, skin and nails	<ul style="list-style-type: none"> <li>• Chemical reaction</li> <li>• Catalyst</li> <li>• Covalent bonding</li> <li>• Ionic bonding</li> <li>• Cell action potential</li> <li>• Cell-electricity conducted unit</li> </ul>		
1.3. Describe the active ingredients found in different hair and beauty products	<ul style="list-style-type: none"> <li>• Detergents</li> <li>• Surfactants</li> <li>• Emollients</li> <li>• Emulsifiers</li> <li>• Humectants</li> <li>• Fatty acids</li> <li>• Fatty</li> <li>• Alcohols</li> <li>• Fatty esters</li> <li>• Solvents</li> <li>• Buffering agents</li> <li>• Chelating agents</li> <li>• Masking agents</li> <li>• Gellants/thickening agents</li> <li>• Colouring agents</li> <li>• Hydroxy acids</li> <li>• Preservatives</li> <li>• Fillers</li> <li>• UV absorbers</li> <li>• Occlusives</li> <li>• Polymers</li> <li>• Enzymes</li> <li>• Free radical scavengers</li> <li>• Proteins</li> <li>• Lipids</li> <li>• Vehicles</li> <li>• Active agents</li> <li>• Micro-encapsulation</li> </ul>		

	<ul style="list-style-type: none"> <li>• Liposomes</li> <li>• Nanotechnology</li> <li>• Stabilisers</li> <li>• Vitamins <ul style="list-style-type: none"> <li>- Vitamin A <ul style="list-style-type: none"> <li>○ Retin A (tretinoin)</li> <li>○ Retinoic acid</li> <li>○ Retinol</li> <li>○ Retinyl palmitate</li> <li>○ Retinaldehyde</li> </ul> </li> <li>- Vitamin B <ul style="list-style-type: none"> <li>○ Niacin</li> <li>○ Nicotinamide</li> <li>○ Niacinamide</li> </ul> </li> <li>- Vitamin C <ul style="list-style-type: none"> <li>○ Ascorbic acid</li> <li>○ Ascorbyl palmitate</li> </ul> </li> <li>- Vitamin E <ul style="list-style-type: none"> <li>○ Copper peptides</li> <li>○ Tocopherols/tocotrinols</li> </ul> </li> </ul> </li> <li>• Anti-microbials <ul style="list-style-type: none"> <li>- Arnica extracts</li> <li>- Azelaic acid</li> </ul> </li> <li>• Anti-inflammatories <ul style="list-style-type: none"> <li>- Aloe vera</li> <li>- Azulene</li> <li>- Allantoin</li> </ul> </li> <li>• Antioxidants <ul style="list-style-type: none"> <li>- Selenium</li> <li>- Green tea</li> <li>- Acai</li> <li>- Alpha lipoic acid</li> <li>- Ubiquinone</li> <li>- Glutathione</li> <li>- Resveratrol</li> </ul> </li> <li>• Cleansers <ul style="list-style-type: none"> <li>- Sodium lauryl sulphate</li> <li>- Cocamidopropyl betaine</li> <li>- Diethanolamine</li> <li>- Isohexadecane</li> </ul> </li> <li>• Moisturisers <ul style="list-style-type: none"> <li>- Shea butter</li> <li>- Vegetable glycerine</li> </ul> </li> </ul>		
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	<ul style="list-style-type: none"> <li>- Ceramides</li> <li>- Urea</li> <li>- Coenzyme Q10</li> <li>- Amino acids</li> <li>- Lactate</li> <li>- Liquid crystals</li> <li>• Skin lighteners               <ul style="list-style-type: none"> <li>- Hydroquinone</li> <li>- Kojic acid</li> <li>- Licorice</li> <li>- Azelaic acid</li> <li>- Arbutin</li> </ul> </li> <li>• Serums               <ul style="list-style-type: none"> <li>- Phytoestrogens</li> <li>- Flavonoids</li> <li>- Omegas</li> <li>- Peptides</li> <li>- Amino acids</li> <li>- Alcohol</li> <li>- Acetone</li> <li>- Phytosterols</li> <li>- Polyphenols</li> <li>- Microbiomes</li> </ul> </li> <li>• Delivery technology               <ul style="list-style-type: none"> <li>- Liposomes</li> <li>- Nanosomes</li> <li>- Fullersomes</li> </ul> </li> </ul>		
1.4. Explain the effect of functional groups on the reactivity of molecules in products	<ul style="list-style-type: none"> <li>• Hydrocarbons</li> <li>• Alkanes</li> <li>• Alkenes</li> <li>• Alkynes</li> <li>• Aromatic</li> <li>• Alcohols</li> <li>• Ethers</li> <li>• Aldehydes</li> <li>• Ketones</li> <li>• Carboxylic acids</li> <li>• Esters</li> <li>• Amines</li> <li>• Amides</li> <li>• Nitrile</li> <li>• Thiol</li> </ul>		

LO2 Understand the effects and safe use of active ingredients in hair and beauty products			
2.1. Explain the desired effects of products in relation to their chemical composition	<ul style="list-style-type: none"> <li>• Facial skincare products</li> <li>• Make-up products</li> <li>• Body care products</li> <li>• Hair care products</li> <li>• Nail care products</li> </ul>	<ul style="list-style-type: none"> <li>• OHP/Whiteboard</li> <li>• Lecture</li> <li>• Q&amp;A</li> <li>• Handout</li> <li>• Homework</li> <li>• Test</li> </ul>	20
2.2 Explain how to follow safe working practices with regard to contra-indications presented by the client	<ul style="list-style-type: none"> <li>• Compliance with current legislation</li> <li>• Client consultation and contra-indications</li> <li>• Client disclosure</li> <li>• Scope of practice</li> <li>• Compliance with any relevant code of conduct</li> <li>• Referral</li> </ul>		
2.3. Explain how to follow safe working practices with regard to the storage, handling and application of hair and beauty products	<ul style="list-style-type: none"> <li>• Use and storage of products</li> <li>• Stock control/rotation</li> <li>• Storage temperatures</li> <li>• Appropriate bottles and closures</li> <li>• Product stability</li> <li>• Out of reach of children</li> <li>• Breakages/spillages</li> <li>• Product data sheets</li> <li>• Shelf life</li> <li>• Appropriate personal protective equipment</li> <li>• Current legislative controls</li> <li>• Adherence to all product safety precautions and manufacturers' instructions</li> </ul>		
2.4. Identify the organisations responsible for monitoring the safety, standardisation and lethal dose (LD50) testing of hair and beauty products	<ul style="list-style-type: none"> <li>• General compliance of the country therein</li> <li>• Cosmetic product regulations</li> <li>• Local authorities</li> <li>• Governmental legislation</li> <li>• Legal compliance</li> <li>• Trading standards</li> <li>• Consumer safety</li> </ul>		
2.5. Explain the problems associated with the use of oils as active ingredients	<ul style="list-style-type: none"> <li>• Animal, vegetable, mineral or synthetic</li> <li>• Instability</li> <li>• Absorb oxygen</li> <li>• Polymerise</li> <li>• Comedogenic</li> <li>• Water immiscible</li> <li>• Carcinogenic</li> </ul>		

	<ul style="list-style-type: none"> <li>• Combustible</li> <li>• Viscous</li> </ul>		
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LO3 Understand the properties of packaging materials in relation to their structure			
3.1. Explain the chemical properties of packaging materials in relation to their chemical structure	<ul style="list-style-type: none"> <li>• Packaging types, size, shape and uses</li> <li>• Packaging and dispensing systems i.e. glass, metal, plastic</li> </ul>	<ul style="list-style-type: none"> <li>• OHP/Whiteboard</li> <li>• Lecture</li> <li>• Q&amp;A</li> <li>• Homework</li> <li>• Test</li> </ul>	20
3.2. Explain the effects of tensile and compressive forces on metals, glasses, elastomers, thermoplastics, thermosets and ceramics, fibrous materials	<ul style="list-style-type: none"> <li>• Compressive stress</li> <li>• Tensile stress</li> <li>• Ductile failure</li> <li>• Brittle failure</li> <li>• Fatigue</li> <li>• Buckling</li> <li>• Wear</li> <li>• Creep</li> <li>• Fracture</li> <li>• Deformation</li> <li>• Yielding</li> </ul>		
3.3. Explain the effects of shape and temperature on the properties of packaging materials	<ul style="list-style-type: none"> <li>• Packaging types i.e. glass, plastic</li> <li>• Loose fill</li> <li>• Paper</li> <li>• Corrugated fibreboards</li> <li>• Foam structures</li> <li>• Moulded pulp</li> <li>• Inflated products</li> </ul>		

LO4 Understand the properties and effects of ultra-violet radiation on hair and beauty products and their packaging materials			
4.1. Explain the properties and categories of ultra-violet radiation	<ul style="list-style-type: none"> <li>• Light spectrum</li> <li>• UVA</li> <li>• UVB</li> <li>• UVC</li> </ul>	<ul style="list-style-type: none"> <li>• OHP/Whiteboard</li> <li>• Lecture</li> <li>• Q&amp;A</li> <li>• Homework</li> <li>• Test</li> </ul>	15
4.2. Explain how ultra-violet radiation can affect the chemical composition of hair and beauty products	<ul style="list-style-type: none"> <li>• Efficacy and life expectancy of active ingredients</li> <li>• Oxidation</li> <li>• Polymerisation</li> <li>• Hydrolysis</li> </ul>		

<p>4.3. Explain how the exposure and transmission of ultra-violet radiation can affect packaging materials for hair and beauty products</p>	<ul style="list-style-type: none"> <li>• Degradation of packaging</li> <li>• Shelf life</li> <li>• Life expectancy after opening</li> <li>• Oxidation</li> </ul>		
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**Document History**

Version	Issue Date	Changes	Role
v1	01/10/2019	First published	Qualifications Administrator
v2	28/01/2020	Edited to match Unit Specification	Qualifications Administrator