**ITEC Level 4**

**Unit 859 – Chemistry of Hair and Beauty Products**

**Recommended Minimum Guided Learning Hours – 75**

Unit Accreditation Number: K/601/5346

| **Learning outcome**<br>The Learner will:<br><br>1. Understand the chemistry of active ingredients in hair and beauty products | |
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| **Assessment Criteria** | **Taught Content** |
| 1.1 Explain the differences between chemical compounds found in hair and beauty products | 1.1.1 To include:<br>▪ Matter ▪ Element ▪ Atom ▪ Nucleus ▪ Protons ▪ Neutrons ▪ Electrons ▪ Ions ▪ Anions ▪ Cations ▪ Molecules ▪ Covalent bonding ▪ Compound ▪ Mixture ▪ Solution ▪ Solvent ▪ Solute ▪ Bases |
| 1.2 Explain the chemical reaction process that occurs in ingredients found in hair and beauty products and their effects on the hair and scalp | 1.2.1 To include:<br>▪ Chemical reaction ▪ Catalyst ▪ Covalent bonding ▪ Ionic bonding |
| 1.3 Describe the active ingredients found in different hair and beauty products | 1.3.1 To include:<br>▪ Detergents ▪ Surfactants ▪ Emollients ▪ Emulsifiers ▪ Humectants ▪ Fatty Acids ▪ Fatty Alcohols ▪ Fatty Esters ▪ Solvents ▪ Buffering agents ▪ Chelating agents ▪ Masking agents ▪ Gellants/thickening agents ▪ Colouring agents ▪ Hydroxy acids ▪ Preservatives ▪ Fillers ▪ UV absorbers ▪ Occlusives ▪ Polymers ▪ Enzymes ▪ Free radical scavengers ▪ Proteins ▪ Lipids ▪ Vehicles ▪ Active agents ▪ Micro-encapsulation ▪ Liposomes ▪ Nanotechnology ▪ Stabilisers ▪ **Vitamins:**<br>Vitamin A: e.g. ▪ Retin A (tretinoin) ▪ Retinoic acid ▪ Retinol ▪ Retinyl palmitate ▪ Retinoids ▪ Retinaldyhide<br>Vitamin B: e.g. ▪ Niacin ▪ Nicotinamide ▪ Niacinamide<br>Vitamin C: e.g. ▪ Ascorbic Acid ▪ Ascorbyl palmitate<br>Vitamin E: e.g. ▪ Copper peptides ▪ Tocopherols/tocotrinols |

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| | Anti microbials: e.g. ▪ Arnica extracts ▪ Azelaic acid<br>Anti inflammatories: e.g. ▪ Aloe vera ▪ Azulene ▪ Allantoin<br>Antioxidants: e.g. ▪ Selenium ▪ Green tea ▪ Acai ▪ Alpha lipoic acid ▪ Ubiquinone ▪ Glutathione ▪ Resverarol<br>Cleansers: e.g. ▪ Sodium lauryl sulfate ▪ Cocamidopropyl betaine ▪ Diethanolamine ▪ Isohexadecane<br>Moisturisers: e.g. ▪ Shea butter ▪ Vegetable glycerine ▪ Ceramides ▪ Urea ▪ Coenzyme Q10 ▪ Amino acids ▪ Lactate ▪ Liquid crystals<br>Skin lighteners: e.g. ▪ Hydroquinone ▪ Kojic acid ▪ Licorice ▪ Azelaic acid ▪ Arbutin<br>Serums: e.g. ▪ Phytoestrogens ▪ Flavonoids ▪ Omegas ▪ Peptides ▪ Amino acids ▪ Alcohol ▪ Acetone ▪ Phytosterols ▪ Polyphenols<br>Delivery technology: e.g. ▪ Liposomes ▪ Nanosomes ▪ Fullersomes |
| 1.4 Explain the effect of functional groups on the reactivity of molecules in products | 1.4.1 To include:<br>▪ Hydrocarbons ▪ Alkanes ▪ Alkenes ▪ Alkynes ▪ Aromatic ▪ Alcohols ▪ Ethers ▪ Aldehydes ▪ Ketones ▪ Carboxylic Acids ▪ Esters ▪ Amines ▪ Amides ▪ Nitrile ▪ Thiol |
| **Learning outcome**<br>The Learner will:<br><br>2. Understand the effects and safe use of active ingredients in hair and beauty products | |
| **Assessment Criteria** | **Taught Content** |
| 2.1 Explain the desired effects of products in relation to their chemical composition | 2.1.1 To include:<br>▪ Facial skincare products ▪ Make-up products ▪ Body care products ▪ Hair care products ▪ Nail care products |
| 2.2 Explain how to follow safe working practices with regard to contraindications presented by the client | 2.2.1 To include:<br>• Compliance with current legislation • Client consultation and contraindications • Client disclosure • Scope of practice • Compliance with any relevant Code of Conduct • Referral |
| 2.3 Explain how to follow safe working practices with regard to the storage, handling and application of hair and beauty products | 2.3.1 To include:<br>▪ Use and storage of products • Stock control/rotation ▪ Storage temperatures • Appropriate bottles and closures • Product stability • Out of reach of children • Breakages/spillages • Product data sheets ▪ Shelf life ▪ Appropriate personal protective equipment ▪ Current legislative controls • Adherence to all product safety precautions and manufacturers' |

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| | instructions |
| 2.4 Identify the organisations responsible for monitoring the safety, standardisation and Lethal Dose (LD 50) testing of hair and beauty products | 2.4.1 To include:<br>▪ General compliance of the country therein ▪ Cosmetic product regulations ▪ Local authorities ▪ Governmental legislation ▪ Legal compliance ▪ Trading Standards ▪ Consumer Safety |
| 2.5 Explain the problems associated with the use of oils as active ingredients | 2.5.1 To include:<br>▪ Animal, vegetable, mineral or synthetic ▪ Instability ▪ Absorb oxygen ▪ Polymerise ▪ Comedogenic ▪ Water immiscible ▪ Carcinogenic ▪ Combustible ▪ Viscous |
| **Learning outcome**<br>The Learner will:<br><br>3. Understand the properties of packaging materials in relation to their structure | |
| **Assessment Criteria** | **Taught Content** |
| 3.1 Explain the chemical properties of packaging materials in relation to their chemical structure | 3.3.1 To include:<br>▪ Packaging types, size, shape and uses ▪ Packaging and dispensing systems i.e. glass, metal, plastic |
| 3.2 Explain the effects of tensile and compressive forces on metals, glasses, elastomers, thermoplastics, thermosets and ceramics, fibrous materials | 3.2.1 To include:<br>▪ Compressive stress ▪ Tensile stress ▪ Ductile failure ▪ Brittle failure ▪ Fatigue ▪ Buckling ▪ Wear ▪ Creep ▪ Fracture ▪ Deformation ▪ Yielding |
| 3.3 Explain the effects of shape and temperature on the properties of packaging materials | 3.3.1 To include:<br>▪ Packaging types i.e. glass, plastic ▪ Loose fill ▪ Paper ▪ Corrugated fibreboards ▪ Foam structures ▪ Moulded pulp ▪ Inflated products |

| **Learning outcome**<br>The Learner will:<br><br>4. Understand the properties and effects of ultra-violet radiation on hair and beauty products and their packaging materials | |
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| **Assessment Criteria** | **Taught Content** |
| 4. 1 Explain the properties and categories of ultra-violet radiation<br><br>4.2 Explain how ultra-violet radiation can affect the chemical composition of hair and beauty products<br><br>4.3 Explain how the exposure and transmission of ultra-violet radiation can affect packaging materials for hair and beauty products | 4.1.1 To include:<br>▪ Light spectrum ▪ UVA ▪ UVB ▪ UVC<br><br>4.2.1 To include:<br>▪ Efficacy and life expectancy of active ingredients ▪ Oxidation ▪ Polymerisation ▪ Hydrolysis<br><br>4.3.1 To include:<br>▪ Degradation of packaging ▪ Shelf life ▪ Life expectancy after opening ▪ Oxidation |
| **Unit 859 – Chemistry of Hair and Beauty Products**<br><br>**Assessment**<br>All Learners will be assessed via an assignment and a multiple choice question paper for this unit. For details please see www.itecworld.co.uk | **Unit 859 – Chemistry of Hair and Beauty Products** assignment guidance and assessment forms may be downloaded from www.itecworld.co.uk |