



Nature Care College

Chemistry & Pharmacology of Essential Oils DISTANCE/BLENDED LEARNING

DESCRIPTION

This unit of study will give you a working knowledge of basic organic chemistry, focusing on the study of essential oil constituents, including the nature and properties of various functional groups which are found in essential oil molecules, as well as the absorption, metabolism and therapeutic/toxic effect of essential oils in humans.

DURATION

One term (12 weeks) approximately 24 learning hours.

LEARNING OUTCOMES

By the conclusion of the unit of study, students should be able to:

1. Distinguish between matter and energy.
 Recognise atoms as the most basic descriptive unit of matter.
 State the characteristics of protons, neutrons and electrons (charge and position in the atom).
 Explain the structure and uniqueness of types of atoms in terms of numbers of protons, neutrons and electrons.
 Explain the difference between a compound and an element in terms of types of atoms.
 List the atomic characteristics of hydrogen, carbon and oxygen atoms.
 Explain the concept of charge balance within the atom, and the Law of Atomic Harmony.
 Explain the bonding capabilities of each type of atom.
 Understand that formation of bonds involves energy transfer and localisation of electrons.
 Explain covalent bonding (sharing of at least one pair of electrons)
 Predict the various possible structures of compounds if given the number and types of atoms involved.
 Use stick diagrams, electron dot diagrams and formulae to depict atoms, covalent bonding and molecules.
 Explain why energy is needed for bond breaking and reformation during chemical reactions.
 Write a word equation for a chemical reaction using "+" and "-"
2. Demonstrate how isoprene units are the building blocks of terpenoid compounds.
 List the types of non-terpenoid constituents also found in essential oils, e.g. phenolic compounds, sulfur and nitrogen containing compounds and short chain aliphatic compounds.
 State the structures of the functional groups found in essential oil compounds, and their therapeutic properties.
3. Draw the general pathway of essential oil production in most plants, starting from photosynthesis through to manufacture of secondary metabolites.
4. Explain polarisation of molecules due to electro negativity and unbonded electron pairs.
 Draw a diagram illustrating "hydrogen bonding" of water.
 Explain the concepts hydrophilic and lipophilic.

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Explain why essential oils do not dissolve in water, but will dissolve in other solvents such as ethanol and vegetable oils.
Explain how emulsifiers and dispersing agents aid in the forming of an emulsion between oil and water.

5. Identify the routes by which essential oils can enter the human body.
List the rate limiting factors of the absorption of essential oils by the skin.
Identify the skin as the first site of essential oil metabolism during a massage session.
List the types of metabolic changes which the liver performs on essential oils: oxidation, reduction, addition of sulfate and glucuronate groups.
State the metabolic fate of essential oils in the body.
Give examples of pharmacological effects of essential oils in humans.
Research the chemistry of a given essential oil, and make suggestions as to its probable properties based on its chemical constituents.
6. List the various types of distillation method, and to state the variations in essential oil quality produced by each method.
Explain the optical activity of essential oil compounds and its use in quality control.
Explain refractive index and its value in quality control.
Explain specific gravity and its value in quality control.

TEACHING METHOD

This subject will be studied by the method known as "Distance/Blended Learning". This form of study involves your completion of all learning outcomes without formal attendance at lectures or other types of classes.

The benefits of this system are considerable as it contributes significant flexibility to your study programme. It also encourages students to take responsibility for their own learning, enhancing those mandatory skills of self-education. There will be considerable support from the College to aid you in your studies.

A tutor will be available to answer any academic questions students may have. Details regarding this will be in the information and instruction sheet that will be sent to you upon enrolment.

ASSESSMENT

An Assessment Pack will be included in your Distance/Blended Learning folder.

Pass mark: 60%

COMPETENCIES PARTIAL COMPLETION

Successful completion of this Unit of Study is in partial completion of the following Health Training Package HLT07 Units of Competency

HLTARO509A - Successful completion of this Unit of Study is in partial completion of the following Health Training Package HLT07 Units of Competency:
HLTAP501A - Plan a specialised aromatherapy treatment

ENROLMENT

You may enrol into this subject at any time. Unit of study fees must be paid in full when you enrol. All fees are *non-transferable and non-refundable*. You can enrol in person, over the telephone using a credit card, or by mail.

Once you have enrolled you will be sent the Distance/Blended Learning workbook together with a detailed instruction and information sheet.

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PRE-REQUISITES	Aromatherapy Studies, Anatomy & Physiology 1A
CO-REQUISITES	Anatomy & Physiology 1B
TEXTBOOKS	<p>(a) Compulsory:</p> <p>Clark S. Essential Chemistry for Safe Aromatherapy. Churchill Livingstone; 2002</p> <p>(b) Recommended Reading / References:</p> <p>Battaglia S. The Complete Guide to Aromatherapy. The Perfect Potion Caddy R. Essential Oils In Colour, 2nd ed. Amberwood Publishing Ltd; 2000 Lawless J. The Encyclopedia of Essential Oils; 1991 Tisserand R. Essential Oil Safety. Livingstone; 1995 Williams The Chemistry of Essential Oils. Micelle Press; 1995 Bowles EJ. The Chemistry of Aromatherapeutic Oils. Allen & Unwin; 2003 Bowles EJ. The A to Z of Essential Oils. New Burlington Books; 2003 Lis Balchin M. Aroma Science. Amberwood Publishing; 1999</p>

SUGGESTED HOME STUDY PLAN:

WEEK 1	Housekeeping; dates; aims of the course; assessment tasks. Introduction to Chemistry. Productions of chemicals by plants.
WEEK 2	Chemical reactions. Solubility; electronegativity – emulsions. Productions of chemicals by plants.
WEEK 3	Organic Chemistry. Terpenoids. Isomers.
WEEK 4	Alcohols. Optical isomers.
WEEK 5	Phenols. Introduction to pharmacology.
WEEK 6	Aldehydes. Deterioration of essential oils.
WEEK 7	Ketones. Metabolism of essential oils.

WEEK 8	Acids and Esters. Quality control.
WEEK 9	Ethers and oxides. Toxicity.
WEEK 10	Lactones and Coumarins.
WEEK 11	Revision.
WEEK 12	Assessment due