



Introduction

Botany and its role in the ecosystem

*Plant science and
symbiosis, taxonomy, habitats,
identification & botanical keys*

A modular course in botany and its role in the ecosystem



Anatomy, Physiology, Symbiosis, Taxonomy,
Habitats, Identification & Using a Key

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Botany and its role in the ecosystem



A modular course in Plant Science, Ecology, Identification Skills and using Botanical Keys

Introduction

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Welcome to **Botany and its role in the ecosystem**, a modular course in plant science, ecology and botanical identification. This course is designed for anyone with an interest in botany and ecology who is keen to learn how to use plant features for accurate identification and understand the role of botany in an ecosystem. This course will cover the identification of angiosperm vascular plants – flowering plants, ferns and trees.

- **Module 1: Plant Science: biology, physiology and symbiosis**
- **Module 2: Plant identification and using a key**
- **Module 3: Taxonomy**
- **Module 4: Habitats and habitat indicators**



Module 1: Plant Science



Module 2: Plant Identification



Module 3: Taxonomy



Module 4: Habitats and Habitat Indicators

ⓘ Please note that this course does not cover grasses, rushes or sedges. These will be covered in a separate course.

Course Level

You may already have an interest and some experience in botany or be a University graduate in a geographical, ecological or environmental discipline and want to improve your identification skills or you may be a beginner or improver who wants to get to grips with botanical keys and identification guides. This course is also suitable for conservation volunteers who need to gain botanical ID skills in order to conduct surveys and record species for conservation charities or for anyone with an interest in botany and its role in the ecosystem.

This course aims to help you:

- Prove your commitment to continued professional development (CPD) for professional membership of **CIEEM** or similar organisations
- Helps towards achievement of a **Field Identification Skills Certificate Level (FISC)**
- Helps professionals, volunteers and graduates make accurate identifications in the field
- Provide a well rounded view of plant science and symbiosis, botanical identification, naming structures and hierarchies (taxonomy), habitats and habitat indicators and effects of pollution in freshwater habitats.



Figure 1: Lesser Celandine
Ficaria verna ssp verna

This flexible self-study course is designed to help you, whether you are a beginner or an improver, to gain confidence in identifying plants down to species, or even subspecies, level and to understand the role of plants in the ecosystem.

Support

Throughout the course, you will have access to a mentor should you need clarification or help. The email address is mentor@qualiteach.co.uk. This is a flexible course which you can study in your own time and the course duration and suggested guided learning hours are for guidance only. However, please note that mentor support is available to each candidate for **10 weeks from date of enrolment**. Thereafter, general course enquiries should then be directed to contact@qualiteach.co.uk.

Course Structure

Botany and its role in the ecosystem is a modular course comprising four modules in plant science and symbiosis, botanical identification and keys, taxonomy and habitats. **Plant Science & Symbiosis** covers plant structure, biology and physiology, growth and reproduction and its role within an ecosystem, exploring symbiosis between plants and fungi, bacteria and insects. **Plant Identification and Botanical Keys** covers the identifying features of a plant, such as reproductive organs, inflorescence, hairs, bracts and stem/leaf shape and how to use a botanical key. **Taxonomy** covers the naming rules and hierarchical structure of plants, sub-species and hybrids, and helps you to understand the meaning behind scientific names. **Habitats and Habitat Indicators** covers environmental conditions for growth, habitat types in the UK, soil types and indicator plants, as well as exploring effects of pollution on freshwater habitats.

Each module is broken down into sections with an activity and/or quiz at the end of each section to test knowledge and understanding. After completing the quiz and/or activity you can check your responses against the answer file provided. You can work through the modules in any order. If, after completing the course material and end of section tests, you decide you don't want to take the end of module assessment for the Certificate of Achievement, you will still receive a Certificate of Participation.

- ❗ Please note that we do not provide an online identification service as part of this course and students are advised to register with and use iSpot Nature (details below). Each one of our mentor team is a registered iSpot member.

Course Duration and Content

The course comprises four modules which can be studied as stand-alone courses or as a full course. Although the course is flexible and designed to be studied in your own time, it is estimated that the full course should take approximately 20-30 hours at 2 or 3 hours per week over a 10 week period. The Plant Identification module is the longest with a recommended study time of approximately 8-12 hours. The Taxonomy course is approximately 2-4 hours in length whilst the recommended study time for the remaining two modules is 5-7 hours each.

These are just some of the subjects covered in the course:

Module 1: Plant Science: biology, physiology and symbiosis

- The importance of botany
- Symbiosis and food plants (including nitrogen fixation, fungal and bacterial relationships)
- The Food Web
- Plant biology and reproduction
- Plant physiology and transport systems (xylem, phloem, transpiration and photosynthesis)
- Perennation and life-form categories
- Roots, shoots, seeds, bulbs and rhizomes
- Succession

Module 2: Plant Identification

- Identification via plant components:
 - Reproductive organs
 - Inflorescence (flowers)
 - Stems
 - Hairs
 - Sepals and bracts
 - Leaves
 - Seeds, pods and fruit
- Identifying Ferns
- Identifying Trees
- Putting it all together
- Lookee Likees
- Using a botanical key

ⓘ Please note that we do not encourage learners to uproot plants in order to identify them. Where possible please try and identify a plant in-situ. It is an offence to pick plants without the landowner's permission. It is also an offence for anyone to pick, uproot or destroy a protected plant species that is currently on Schedule 8 (Section 13) of the Wildlife and Countryside Act 1981 (as amended).

Module 3: Taxonomy

- Binomials, families, genus and species
- Hybrids
- Subspecies
- Scientific names and their meanings

Module 4: Habitats and Habitat Indicators

- Where does it grow – habitat types and indicator plants
- Environmental conditions for growth (including niches and growing strategies, soil conditions and plant morphology)
- Habitat types (freshwater, coastal, mountainous, bog, fen, woodland)
- Habitat Indicators (incl. halophytes, acid bog indicators)
- Plants for phytoremediation
- Eutrophication and pollution

Tests and Certification

This course is modular which means that students can choose to purchase and study each of the modules on its own leading to individual module certification or, for a well-rounded view of botany and plant science and its role in the ecosystem, complete all four modules and gain a full course **Certificate of Achievement in Botany and its role in the ecosystem**.

The tests will be marked by your mentor and are open assessments allowing candidates to use learning materials and tutorials from the course to help complete the tests. Candidates are allowed three attempts at the same test. For each individual **end of module test** you will need a pass score of at least 80% in order to achieve a single module **Certificate of Achievement**. If after three attempts the test results are below the pass score of 80%, the candidate will receive a **Certificate of Participation**.

If you successfully complete the **end of course test** after completing all four modules, you will receive a further **Certificate of Achievement** for the whole course **Botany and its role in the ecosystem**.

❶ Please note that this course is designed to help you understand the terminology within field guides but is not meant to replace a field guide. Although this course contains descriptions and photographs of several plant species, these do not constitute an exhaustive list of UK plant species and you will still need to consult a field guide for identification.

Course Costs

Each module is priced according to the course size and duration. Unlike most online courses, there are no extra costs for sitting tests or receiving certification. You pay the purchase price for your course when you enrol and there are no other hidden costs thereafter.

Module 1: Plant Science: biology, physiology and symbiosis	£50.00
Module 2: Plant identification and using a botanical key	£100.00
Module 3: Taxonomy	£25.00
Module 4: Habitats and habitat indicators	£50.00

The total cost if a candidate buys each of the modules separately is **£225.00**. If you purchase the whole course in one transaction there is a discount of **£25.00**. This means that candidates enrolling on the complete course, including certification, pay just **£200.00**.

Equipment

If you intend conducting wildflower surveys, either for your own enjoyment, as a volunteer or as part of paid employment, you will need to have the right equipment. Study the list below to see some suggestions for useful items.

- **Hand lens** – 10x, 20x or 30x magnification (a field microscope may also be useful)
- **Good field guide** – downloadable app or book. Recommendations are provided below but there are many other guides from which to choose.
 - **Beginners:** Wild Flowers of Britain and Ireland by Marjorie Blamey, Richard & Alistair Fitter (Bloomsbury)
 - **Intermediate:** The Wild Flower Key by Francis Rose (revised by Claire o'Reilly) (Warne/Penguin Group)
 - **Advanced:** New Flora of the British isles by Clive Stace (Cambridge University Press)
- **Clipboard, pencil, plastic covers** and **recording sheet** (pencils don't run like pen ink does!)
- **Ruler** (or use ruler on book cover of field guide)
- Sealable **freezer bags** (for collecting specimens)
- **Protective gloves** (particularly for when dealing with water or other areas that may harbour bacteria), **clear goggles** (to help prevent eye injury when moving through shrubs and branches or bending down to identify sedges or rushes), **boots** or **wellies**
- **Map** and **GPS** (to pinpoint your location and map reference)
- **Binoculars** for hard to reach areas that can only be accessed from the edge (such as ponds or bogs)
- **Quadrat** or **string** and **pegs** or **poles** for marking out the survey area
- Pond grabber (**grapnel**) but this should only be used when absolutely necessary to prevent disturbance or damage to pond life. You should never use a pond grabber unless absolutely certain that a protected species does not live in the pond. Check with a local wildlife group about the presence of protected species before creating any disturbance.
- **Hi-vis jacket** (important when surveying near main roads)

You may also find it useful to have cleaning equipment for personal hygiene or for maintaining clean equipment to prevent spread of invasive species or bacteria between survey areas (particularly ponds).

- ① **An online course on conducting plant surveys is available from Qualiteach Education. Please see our website for more details: www.qualiteach.co.uk.**



Societies

Botany is an important aspect of an ecosystem but is often overlooked. It represents food and habitat and is the first link in the food chain. A good way to get practical experience is to volunteer with a BSBI County Recorder (Botanical Society of Britain and Ireland) to help identify and record species for your county.

Some societies and websites are listed below that may help you to gain practical experience through volunteering or to gain ID help from other botanists.

- **iSpot Nature**
 - www.ispotnature.org
- **BSBI County Recorders**
 - <http://bsbi.org/local-botany>
- **BSBI** – Botanical Society of Britain and Ireland
 - www.bsbi.org
- **Plantlife/npms** (National Plant Monitoring Scheme)
 - www.plantlife.org.uk
- **The Wildflower Society**
 - www.thewildflowersociety.com
- **Wildlife Trusts**
 - www.wildlifetrusts.org
- **PondNet**
 - www.freshwaterhabitats.org.uk



Contact Details

Email

General queries: **contact@qualiteach.co.uk**

Course help: **mentor@qualiteach.co.uk**

Website

www.qualiteach.co.uk

**Good luck with your studies.
*Fruī doctrina....enjoy learning!***

**Remember, if you need advice, clarification or help during your course,
please contact your mentor:**

mentor@qualiteach.co.uk

Available for 10 weeks from start of enrolment



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