



# University of Pretoria Yearbook 2023

## BScHons (Medicinal Plant Science) (02240706)

**Department** Plant Science

**Minimum duration of study** 1 year

**Total credits** 135

**NQF level** 08

### Admission requirements

1. Relevant BSc degree
2. A weighted average of at least 60% at final-year level
3. A minimum of at least 60% in Phytomedicine (or equivalent)
4. An admission examination may be required

### General information

#### **University of Pretoria Programme Qualification Mix (PQM) verification project**

*The higher education sector has undergone an extensive alignment to the Higher Education Qualification Sub-Framework (HEQF) across all institutions in South Africa. In order to comply with the HEQSF, all institutions are legally required to participate in a national initiative led by regulatory bodies such as the Department of Higher Education and Training (DHET), the Council on Higher Education (CHE), and the South African Qualifications Authority (SAQA). The University of Pretoria is presently engaged in an ongoing effort to align its qualifications and programmes with the HEQSF criteria. Current and prospective students should take note that changes to UP qualification and programme names, may occur as a result of the HEQSF initiative. Students are advised to contact their faculties if they have any questions.*



## Curriculum: Final year

### Minimum credits: 135

Core credits: 105

Elective credits: 30

### Additional information:

Students may register for modules to the maximum of 20 credits presented by another department, which forms part of the elective modules.

Apart from the compulsory and elective modules, a project, leading to a research report (60 credits), forms an essential part of the programme. One seminar (15 credits) must also be written and presented. Field excursions are undertaken. In addition to the compulsory modules, electives are selected in consultation with the supervisor.

## Core modules

### Phytopharmacology 748 (BOT 748)

**Module credits** 10.00

**NQF Level** 08

**Prerequisites** No prerequisites.

**Contact time** 1 discussion class per week, 1 practical per week

**Language of tuition** Module is presented in English

**Department** Department of Plant and Soil Sciences

**Period of presentation** Semester 1

#### Module content

Pharmacological action of low molecular plant constituents and high molecular weight compounds. Plant constituents as anticancer, antibacterial, antiviral, hypoglycaemic, freeradical scavengers, hypotensive and as anti-inflammatory agents. Cell culturing, cell growth and apoptosis, cell mediated immune responses. Drug development in TB as models for research. Enzymes, receptors and plant constituents. The unique challenges of plant-based medicines.

### Pharmacognosy/Phytotherapy 749 (BOT 749)

**Module credits** 10.00

**NQF Level** 08

**Prerequisites** No prerequisites.

**Contact time** 1 discussion class per week, 1 practical per week

**Language of tuition** Module is presented in English

**Department** Department of Plant and Soil Sciences

**Period of presentation** Semester 1



### Module content

Basic concepts of toxicology. Systemic, developmental, genetic and organ-specific toxic effects. Hallucinogenic, allergenic, teratogenic and other toxic plants. Plant constituents, contradictions and interactions. Phytotoxicity unrelated to plant constituents. Safety and efficacy issues of commonly used Phyto-drugs with emphasis on pharmaceutical applications. Practical aspects related to the manufacture of good quality plant-based medicines. Phyto-drug formulation, standardisation and aspects concerning different dosage forms.

### Advanced phytomedicine 761 (BOT 761)

<b>Module credits</b>	10.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	1 lecture per week, 1 practical per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Department of Plant and Soil Sciences
<b>Period of presentation</b>	Semester 2

### Module content

Metabolism and functions of secondary compounds such as tannins, alkaloids, terpenoids, flavonoids and free amino acids. Importance of secondary compounds in the defence mechanisms of plants. Isolation and identification of medicinal bioactive compounds from plants. Their current scope and potential applications in ethnobotany. Strategies to discover new pharmaceuticals from ethnomedicine.

### Research report 782 (BOT 782)

<b>Module credits</b>	60.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Department of Plant and Soil Sciences
<b>Period of presentation</b>	Year

### Module content

A mini research project with defined limits is undertaken under the guidance of a supervisor. The students identify potential projects by contacting supervisors from the different research programmes in the department. A list of projects on offer can be obtained from the Honours coordinator, and in exceptional circumstances a student can propose a project not listed. The module also has a strong theoretical component since emphasis is placed on writing and presenting a detailed project proposal. Additional relevant technical and analytical training is provided by the respective supervisors. The project is concluded with a final mini dissertation, presented in the format of a short manuscript, as well as an oral presentation.

### Seminar 783 (BOT 783)

<b>Module credits</b>	15.00
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<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Department of Plant and Soil Sciences
<b>Period of presentation</b>	Semester 1

#### Module content

Literature study, discussion and oral presentation of a subject related to the main discipline.

## Elective modules

### Crop physiology 761 (APS 761)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	2 lectures per week, Fortnightly practicals
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Department of Plant and Soil Sciences
<b>Period of presentation</b>	Semester 2

#### Module content

An overview of photosynthesis and respiration, with the aim of examining the physiological basis of yield in cropping systems. This includes an assessment of parameters for determining plant growth, factors governing yield, partitioning of photoassimilates within plants and opportunities for increasing yield. Crop growth and yield will be put into context of a changing global climate. Evaluation of the manner in which plants respond to various abiotic stresses and how plants sense changing environments. The various roles of plant growth regulators in plants and the importance of these compounds in agriculture.

### Statistics for biological sciences 780 (BME 780)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<b>Service modules</b>	Faculty of Natural and Agricultural Sciences
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	2 Block weeks
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Statistics
<b>Period of presentation</b>	Semester 1



## Module content

The principles of experimental design as required for the selection of an appropriate research design. Identification of the design limitations and the impact thereof on the research hypotheses and the statistical methods. Identification and application of the appropriate statistical methods needed. Interpreting of statistical results and translating these results to the biological context.

## Applied plant anatomy 741 (BOT 741)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	BOT 161 or permission from the Head of Department.
<b>Contact time</b>	Block of 4 weeks for lectures with practical compo
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Department of Plant and Soil Sciences
<b>Period of presentation</b>	Semester 1 or Semester 2

## Module content

Theory of plant anatomy, understanding of basic tissue types and arrangement within organs. Evolutionary modifications to the basic anatomy. Introduction to seed anatomy/palynology. Understanding of developmental anatomy – ontogeny of tissues/organs. Advantages/disadvantages of different stains/techniques. Microscopy, including electron microscopy. Ethics and protocols of image manipulation. Practical understanding of tissue preservation, staining and sectioning techniques will be learnt and a portfolio of evidence submitted for assessment.

## Plant classification and phytogeography 742 (BOT 742)

<b>Module credits</b>	20.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	BOT 366
<b>Contact time</b>	1 practical per week, 2 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Department of Plant and Soil Sciences
<b>Period of presentation</b>	Semester 2

## Module content

An overview of phylogenetics sets the scene, and sources of taxonomic information (morphology, anatomy, chemotaxonomy, cytogenetics, reproductive biology, palynology, ethnobotany and paleobotany) and how these data are used are discussed. This is followed by a section on the use of phylogenies as tools to understand ecological and geographical patterns and processes. Modern plant distribution patterns are assessed from the framework of the competing explanations of dispersal and vicariance.

## Applications in plant biotechnology 746 (BOT 746)

<b>Module credits</b>	10.00
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<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	1 lecture per week, 1 practical per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Department of Plant and Soil Sciences
<b>Period of presentation</b>	Semester 2

#### Module content

Plant tissue culture. Plant gene transfer technologies (Agrobacterium-based, biolistics and other). Design of plant gene transfer constructs, including synthetic biology. New plant breeding technologies, including plant gene editing. Applications of genetically modified (GM) and gene edited crops and their impact on modern agriculture. Biosafety evaluation and regulation of GM and new plant breeding technologies.

### Trends in plant science 784 (BOT 784)

<b>Module credits</b>	10.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Department of Plant and Soil Sciences
<b>Period of presentation</b>	Semester 2

#### Module content

Literature study of recent publications in a subject related to one of the elective disciplines.

### Plant identification and herbarium curation 786 (BOT 786)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	BOT 161 or permission from the Head of Department.
<b>Contact time</b>	2 Block weeks, 2 practicals per week, 3 Block weeks
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Department of Plant and Soil Sciences
<b>Period of presentation</b>	Semester 1

#### Module content

Principles of identification, classification and nomenclature; identification of plants; family recognition; collection of plant specimens for identification; herbarium as a source of information. Variation in seed plants and breeding systems. Legal and ethical aspects of plant collection and permit requirements. Specimen preparation, including pressing, sterilisation, mounting, labelling and data capture. Introduction to herbarium databases. Herbarium curation and upkeep, including nomenclatural and taxonomic updates and classification systems, and aspects of pest control and health and safety. Practical work involves an excursion.



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## Spatial analysis in ecology 788 (BOT 788)

<b>Module credits</b>	10.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	2 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Department of Plant and Soil Sciences
<b>Period of presentation</b>	Semester 2

### Module content

Mapping and analysing spatial data. Theory and basic techniques of analysing and manipulating spatial data using geographical information systems. Mapping of vegetation types, species distributions and diversity, species traits. Understanding the spatial drivers of biodiversity patterns. The influence of scale on biodiversity analyses. Relevance for conservation planning for mapping biodiversity risk and prioritising conservation, especially in a South African context.

## Plants, people and planet 789 (BOT 789)

<b>Module credits</b>	5.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	3 lectures/tutorials (1 hour each) per week, Presentation of proposal (1 hour), Self study
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Department of Plant and Soil Sciences
<b>Period of presentation</b>	Year

### Module content

Introduction to Community Engagement (CE) in the South African and University of Pretoria context; plant blindness. Identification of community engagement topic and activities, field work and submission of report on these activities.

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### Regulations and rules

The regulations and rules for the degrees published here are subject to change and may be amended after the publication of this information.

The [General Academic Regulations \(G Regulations\)](#) and [General Student Rules](#) apply to all faculties and registered students of the University, as well as all prospective students who have accepted an offer of a place at the University of Pretoria. On registering for a programme, the student bears the responsibility of ensuring that they familiarise themselves with the General Academic Regulations



applicable to their registration, as well as the relevant faculty-specific and programme-specific regulations and information as stipulated in the relevant yearbook. Ignorance concerning these regulations will not be accepted as an excuse for any transgression, or basis for an exception to any of the aforementioned regulations.

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