University of Pretoria Yearbook 2019

BScHons Medicinal Plant Science (02240706)

Minimum duration of study	1 year
Total credits	135

Programme information

Renewal of registration

i. Subject to exceptions approved by the Dean, on the recommendation of the relevant head of department, and in the case of distance education where the Dean formulates the stipulations that will apply, a student may not sit for an examination for the honours degree more than twice in the same module.
ii. A student for an honours degree must complete his or her study, in the case of full-time students, within two years and, in the case of after-hours students, within three years of first registering for the degree and, in the case of distance education students, within the period stipulated by the Dean. Under special circumstances, the Dean, on the recommendation of the relevant head of department, may give approval for a limited extension of this period.

In calculating marks, General Regulation G.12.2 applies.

Apart from the prescribed coursework, a research project is an integral part of the study.

Admission requirements

BSc in Plant Science or a recommendation from the head of department if the candidate did not major in Plant science. A minimum of 60% in Phytomedicine 365 (BOT 365), which is offered at third-year level in the Department of Plant and Soil Science.

The recommended modules at BSc third-year level are as follows:

1. BOT 366 Plant diversity (Department of Plant and Soil Science)
2. BOT 356 Plant ecophysiology (Department of Plant and Soil Science)
3. BCM 368 Molecular basis for disease (Department of Biochemistry)
4. BCM 357 Biocatalysis and integration of metabolism (Department of Biochemistry)
5. FAR 382 Pharmacology (Department of Pharmacology)
6. CMY 282 Physical chemistry (Department of Chemistry)
7. CMY 284 Organic chemistry (Department of Chemistry)

Pass with distinction

The BScHons degree is awarded with distinction to a candidate who obtains a weighted average of at least 75% in all the prescribed modules and a minimum of 65% in any one module.

Curriculum: Final year

Minimum credits: 135

Minimum credits: 135

Core credits: 105

Elective credits: 30

Other programme-specific 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
Prerequisites	No prerequisites.
Contact time	1 practical per week, 1 discussion class 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
Prerequisites	No prerequisites.
Contact time	1 practical per week, 1 discussion class 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)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	1 practical per week, 1 lecture per week
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	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)

Module credits	60.00
Prerequisites	No prerequisites.
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	Semester 1

Module content

Teaching and planning, execution and documentation of a research project.

Seminar 783 (BOT 783)

Module credits	15.00
Prerequisites	No prerequisites.
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	Semester 1

Module content

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

Elective modules

Statistics for biological sciences 780 (BME 780)

Module credits	15.00
Service modules	Faculty of Natural and Agricultural Sciences
Prerequisites	No prerequisites.
Contact time	2 Block weeks
Language of tuition	Module is presented in English
Department	Statistics
Period of presentation	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.

Plant nomenclature 712 (BOT 712)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	1 lecture 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

The regulations of the International Code for Botanical Nomenclature. Principles of nomenclature. History of plant collecting. Type specimens.

Seed ecology 714 (BOT 714)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	1 practical per week, 1 lecture per week, 1 web-based period per week
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	Semester 2

Module content

Regeneration of plants from seed under natural conditions. Early stages in the life of a plant from ovule to established seedling: seed production; seed predation; seed dispersal; seed germination and dormancy, seed bank dynamics and seedling establishment.

Plant morphology 717 (BOT 717)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	1 practical per week, 1 lecture per week
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	Semester 1

Module content

Speciation in flowering plants; plant variation. Sex determination in flowering plants. Reproductive systems in flowering plants.

Introduction to plant biotechnology 718 (BOT 718)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	1 practical per week, 1 lecture per week
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	Semester 1

Module content

Plant genome: structure and composition of the plant genome (nuclear, mitochondrial and chloroplast); applications in plant biotechnology: plant tissue culture (microproagation, somatic embryogenesis and cell suspension cultures). Genetic manipulation and gene transfer technology (Agrobacterium-based and other) and DNA-marker technology.

Primary plant metabolism 719 (BOT 719)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	1 web-based period per week, 1 practical per week, 1 discussion class per week
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	Semester 1

Module content
Regulation and interaction of primary plant metabolic pathways on the sub-cellular and whole plant level.

Plant taxonomy 741 (BOT 741)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	1 lecture 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 2

Module content
Classification, identification and nomenclature, methodology of a revision study, analysis and presentation of taxonomic information, evolution, phylogeny and cladistics.

Plant classification and phytogeography 742 (BOT 742)

Module credits	20.00
Prerequisites	BOT 366
Contact time	2 lectures 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 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 dispersalisn and vicariance.

Applications in plant biotechnology 746 (BOT 746)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	1 lecture 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 2

Module content
Creation of genetically modified plants and their impact on modern agriculture.

Trends in plant science 784 (BOT 784)

Module credits	10.00
Prerequisites	No prerequisites.
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	Semester 2

Module content

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

Practical plant identification 786 (BOT 786)

Module credits	10.00
Prerequisites	BSc with first year Botany/Plant Science
Contact time	2 lectures per week, 2 practicals per week
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	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. Practical work involves an excursion.

Spatial analysis in ecology 788 (BOT 788)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	2 lectures per week
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	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 prioritsing conservation, especially in a South African context.

The information published here is subject to change and may be amended after the publication of this information. The

General Regulations (G Regulations) apply to all faculties of the University of Pretoria. It is expected of students to familiarise themselves well with these regulations as well as with the information contained in the General Rules section. Ignorance concerning these regulations and rules will not be accepted as an excuse for any transgression.