

Agripharmatech

The Certificate of Achievement in Agripharmatech is organized in two tracks: Plant Biotechnology and Ethnopharmacognosy. Each track consists of 30–32 credits, and requires a unique capstone class (see below).

The Plant Biotechnology track deals with developing and improving plant production in order to supply the world's need for healthier (decreased use of pesticides) and more nutritious food crops, novel ornamentals, and plant-derived pharmaceuticals. Ethnopharmacognosy is the study of traditional medicines derived from natural sources (medicinal/nutritious plants).

Students will be able to complete the certificate in 2–3 semesters with coursework flexible enough to prepare them for employment in agricultural biotechnology or pharmacognosy, for entrepreneurship in agribusiness or plant-based product manufacturing, and for seamless credit transfer to higher degree institutions for the study of agriculture, pharmacy, and related disciplines.

After completing the program, students will be able to:

- Apply knowledge gained in plant sciences: identify plants, propagate/cultivate/maintain plants in vivo and in vitro
- Apply knowledge gained in microbial sciences: prepare/maintain bacterial cultures for genetic transformation and bioassay tests
- Conduct plant biotech and/or pharmacognosy research
- In addition, students opting for the biotechnological track will focus on plant molecular genetics, and will:
- Operate specialized lab equipment such as autoclave, gel electrophoresis, PCR machine, Particle Deliver/1000 Helium System, spectrophotometer, fluorescent microscope, Gel Doc System
- Perform DNA/RNA extraction, electrophoresis, PCR reaction, DNA sequencing, gene transformation via bacteria, and particle bombardment, alignment and analyzing DA sequence results using Sequencher, PAUP, Finch TV software systems
- Students opting for the ethnopharmacognosy track will focus on plant pharmacognostical study, and will:
- Operate laboratory equipment: autoclave, spectrophotometer, stereo microscope, anaerobic transfer chamber, rotary evaporator, distiller, Biacore Q system
- Conduct pharmaceutical and nutraceutical research

NOTES

* Math 100 is recommended for those who seek certificates to enter the workforce or become agribusiness entrepreneurs. Otherwise, Math 103 is recommended.

* BOT 199/299 in Ethnopharmacognosy involves pharmaceutical/nutraceutical research.

* BOT 199/200 in Plant Biotechnology involves plant biotechnology research.

Program: Agriculture

Type: Certificate of Achievement

Required Courses (17-18 credits)

Item #	Title	Credits
AG 152	OrchID Culture	3
	BIOL 172/L or BOT 160 or BOT 101/L	3-4
	ENG 100 or SP 151	3
MATH 100	Survey of Mathematics	3
MICR 130	General Microbiology	3
MICR 140L	General Microbiology Lab	2

Ethnopharmacognosy Track: Capstone

Item #	Title	Credits
BOT 205	Ethnobotanical Pharmacognosy	4

Ethnopharmacognosy Track: Electives (8-9 credits)

Choose 8-9 credits from the following

Item #	Title	Credits
AG 149	Plant Propagation	3
BOT 105	Ethnobotany	3
	BOT 130 & 130L	4
BOT 192V	Special Topics in Plant Science	1-4
	BOT 199/299	1-4
	CHEM 161 & 161L	4
FSHN 185	Human Nutrition	3

Plant Biotechnology Track: Capstone

Item #	Title	Credits
	BIOL 275/L or BOT 210	3-4

Plant Biotechnology Track: Electives (8-9 credits)

Item #	Title	Credits
	BIOL 171 & 171L	4
BOT 192V	Special Topics in Plant Science	1-4
	BOT 199/299	1-4
	CHEM 161 & 161L	4
	CHEM 162 & 162L	4

Course Sequencing

BIOL 172/L or BOT 160 or BOT 101/L

Masquerade as MollyR

Submitted by MollyR on Thu, 08/29/2019 - 00:10

Program

3

4

Choose either BIOL 172 & 172L, BOT 101 & 101L, or BOT 160.

BIOL 172

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30

Introduction to Biology II

Program

3

Continuation of BIOL 171. Topics include: Origin of eukaryotic organisms, their general characteristics, life cycles, systematics and evolution; Anatomy, physiology and classification of higher plants; Anatomy, physiology, behavior and classification of animals; and Basic ecological principles.

BIOL 172L

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30

Introduction to Biology II Lab

Program

1

Laboratory to accompany BIOL 172.

BOT 160

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30

Identification of Tropical Plants

Program

3

Nontechnical course in identification of common plants of tropics, including native and introduced flora.

BOT 101

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30

General Botany

Program

3

Introduction to plant structure, function, reproduction, and evolution; plants in relation to the environment and human activities. Lecture course.

BOT 101L

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30

General Botany Lab

Program

1

Lab observations and experiments illustrating basic principles of plant biology.

Off

ENG 100 or SP 151

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Submitted by [MollyR](#) on Thu, 08/29/2019 - 00:11

Program

3

ENG 100

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30

Composition I

Program

3

This college-level composition course promotes critical reading, the writing process, rhetorical principles, research strategies, and the documentation of sources.

SP 151

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30

Personal and Public Speech

Program

3

This course introduces students to the basic principles of human communication. Students will receive practice in improving their competency in the areas of public speaking, specifically in informative and persuasive speaking.

Off

BOT 130 & 130L

Masquerade as MollyR

Submitted by [MollyR](#) on Wed, 08/28/2019 - 21:59

Program

4

BOT 130

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30

Plants in the Hawallan Environment

Program

3

Introduction to the evolution of plant communities and species of Hawaiian ecosystems; ecological interactions; observations, identification and systematics of native and introduced flora.

BOT 130L

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30

Plants in the Hawallan Environment Lab

Program

1

BOT 130L focuses on observations of Native Hawaiian plant species, populations and communities as they interact in the natural environment and studies the unique characteristics of the plants through lab observations.

Off

BOT 199/299

Masquerade as MollyR

Submitted by [MollyR](#) on Thu, 08/29/2019 - 00:17

Program

1

4

Involves pharmaceutical/nutraceutical research.

Off

CHEM 161 & 161L

Masquerade as MollyR

Submitted by MollyR on Thu, 08/29/2019 - 00:17

Program

4

CHEM 161

Submitted by CleanCatalogAdmin on Sat, 08/24/2019 - 23:30

General Chemistry I

Program

3

Basic principles of inorganic chemistry with an emphasis on problem solving. First course of a two-course sequence designed to meet the one-year General Chemistry requirement for pre-med, science and engineering majors. Topics include chemical calculations, electronic structure, chemical bonding, states of matter and solutions.

CHEM 161L

Submitted by CleanCatalogAdmin on Sat, 08/24/2019 - 23:30

General Chemistry I Lab

Program

1

Laboratory experiments illustrating fundamental principles of chemistry.

Off

BIOL 275/L or BOT 210

Masquerade as MollyR

Submitted by MollyR on Thu, 08/29/2019 - 00:12

Program

3

4

Choose either BIOL 275 & 275L or BOT 210.

BIOL 275

Submitted by CleanCatalogAdmin on Sat, 08/24/2019 - 23:30

Cell and Molecular Biology

Program

3

Integrated cell and molecular biology for life science majors. Modern advances in recombinant DNA technology.

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BIOL 275L

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30
Cell and Molecular Biology Lab
Program
1
Laboratory for cell and molecular biology.

BOT 210

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30
Phybiototechnology
Program
4

Introduction to practical aspects of Plant Biotechnology. Topics include micropropagation techniques, such as plant tissue, cell and protoplast cultures; DNA-based technologies, such as DNA extraction, DNA sequencing, PCR; and methods of plant genetic engineering. This course is designed to train students for careers in advanced agriculture technology and industry.

Off

BIOL 171 & 171L

[Masquerade as MollyR](#)
Submitted by [MollyR](#) on Thu, 08/29/2019 - 00:20
Program
4

BIOL 171

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30
Introduction to Biology I
Program
3

First semester of introductory biology for all life science majors. Topics include: Overview of the science of biology; Cell structure, chemistry, growth, and reproduction; Classical, chromosomal and molecular genetics; Evolution, phylogeny and systematics; and Biology and diversity of viruses and bacteria.

BIOL 171L

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30
Introduction to Biology I Lab
Program
1
Laboratory to accompany BIOL 171.
Off

BOT 199/299

Masquerade as MollyR

Submitted by MollyR on Thu, 08/29/2019 - 00:17

Program

1

4

Involves pharmaceutical/nutraceutical research.

Off

CHEM 161 & 161L

Masquerade as MollyR

Submitted by MollyR on Thu, 08/29/2019 - 00:17

Program

4

CHEM 161

Submitted by CleanCatalogAdmin on Sat, 08/24/2019 - 23:30

General Chemistry I

Program

3

Basic principles of inorganic chemistry with an emphasis on problem solving. First course of a two-course sequence designed to meet the one-year General Chemistry requirement for pre-med, science and engineering majors. Topics include chemical calculations, electronic structure, chemical bonding, states of matter and solutions.

CHEM 161L

Submitted by CleanCatalogAdmin on Sat, 08/24/2019 - 23:30

General Chemistry I Lab

Program

1

Laboratory experiments illustrating fundamental principles of chemistry.

Off

CHEM 162 & 162L

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Submitted by MollyR on Thu, 08/29/2019 - 00:20

Program

4

CHEM 162

Submitted by CleanCatalogAdmin on Sat, 08/24/2019 - 23:30

General Chemistry II

Program

3

Second course of a two-course sequence designed to meet the one-year General Chemistry requirement for pre-med, science and engineering majors. Topics include thermochemistry, kinetics, acid-base equilibrium, solubility equilibrium and electrochemistry. Emphasis on problem solving.

CHEM 162L

Submitted by [CleanCatalogAdmin](#) on Sat, 08/24/2019 - 23:30

General Chemistry II Lab

Program

1

Laboratory experiments illustrating fundamental principles of chemistry.

Off