CANNABIS BIOLOGY & CHEMISTRY: HEMP AGRICULTURE CONCENTRATION, BACHELOR OF SCIENCE

The major in Cannabis Biology and Chemistry leads to a Bachelor of Science (BS) degree. The major is a rigorous, interdisciplinary degree that has solid foundations in both biology and chemistry. In addition, a variety of supporting and general education courses are available to meet a wide range of interests, backgrounds and needs. The Cannabis Biology and Chemistry program prepares students to enter the workforce as scientists or technicians in a wide variety of different laboratories including agricultural and food, biology, chemistry, environmental science, and cannabis.

The Hemp Agriculture concentration leads to a CBC BS degree for those with more interest in agriculture.

Program Goals

- To supply students with the necessary coursework to serve as leaders in an emerging cannabis field, providing a non-biased, science-based approach to problem solving and data collection and analysis.
- To prepare students upon graduation to enter field positions in government or private industry.
- To provide students with the necessary background to successfully pursue graduate study towards a professional career in natural products, plant chemistry or biology, or agriculture.

Student Learning Outcomes

- Students will understand basic chemical and biological principles applied in these fields and how those principles can be applied to the emerging field of cannabis science.
- Students will understand cannabis physiology and growth, the pharmacological implications, and the practical applications for the industry.
- Students will use contemporary instruments and techniques for studying plant biological and chemical processes.
- Students will develop communication and interpersonal skills to enhance their working relations with co-workers, other professionals, the public and non-governmental organizations.
- Students will develop skills in reading and interpreting the scientific literature and in presenting a synthesis of it accurately in oral and written form.
- Students will demonstrate critical thinking and problem solving skills using experimental design and the scientific process.

Outcomes Assessment Activities

Assessment of a student's improvement in intellectual skills, knowledge and capacities from entrance to graduation will be accomplished through the use of several tools. Exams and courses assignments will be used as one measure of proficiency in writing skills, acquisition of knowledge, communication, problem solving, and laboratory and field skills. All majors will take a senior seminar course requiring scientific literature interpretation along with oral and written presentations evaluated by peers and department faculty.

Courses with the following prefixes are online courses through Colorado State University (Fort Collins). These courses can be taken simultaneously through CSU Pueblo and CSU to fulfill coursework in this emphasis.

Specific Core Requirements

This will share the same Core coursework as other Cannabis Biology and Chemistry concentrations.

Course	Title	Credits
BIOL 181	College Biology I/Organismal Bio (GT-SC2)	3
BIOL 181L	College Biology I/Organismal Bio Lab (GT-SC1)	1
BIOL 182	College Biology II/Cellular Biology (GT-SC2)	3
BIOL 182L	College Biology II/Cellular Bio Lab (GT-SC1)	1
BIOL 201	Botany (GT-SC2)	2
BIOL 201L	Botany Laboratory (GT-SC1)	2
BIOL 465	Environmental Toxicology	3
CHEM 121	General Chemistry I (GT-SC2)	4
CHEM 121L	General Chemistry Lab I (GT-SC1)	1
CHEM 122	General Chemistry II (GT-SC2)	4
CHEM 122L	General Chemistry Lab II (GT-SC1)	1
CHEM 301	Organic Chemistry I	3
CHEM 301L	Organic Chemistry Lab I	2
CHEM 302	Organic Chemistry II	3
CHEM 302L	Organic Chemistry Lab II	2
CHEM 311	Biochemistry Survey	3
CBC 413	Cannabis Physiology & Growth	3
CBC 413L	Cannabis Physiology & Growth Lab	1
CBC 463	Medicinal Chemistry & Pharmacology	3
CBC 493	Seminar	1

Additional Requirements

Course	Title	Credits
BIOL 171	First Year Seminar	0.5-1
or CHEM 170	Academic Orientation	
Must take CHEM 370 after CHEM 170 is completed		
BIOL 350	Mendelian and Population Genetics	2
BIOL 351	Molecular Biology and Genetics	2
CHEM 498	Internship	1-6
MATH 126	Calculus & Analytic Geometry I (GT-MA1)	4-5
or MATH 221	Applied Calc: An Intuitive Approach (GT-MA1)	
PHYS 201	Principles of Physics I (GT-SC2)	3-4
or PHYS 221	General Physics I	
PHYS 202	Principles Of Physics II (GT-SC2)	3-4
or PHYS 222	General Physics II	
The following courses are online offerings from CSU Fort Collins		
AREC 300 - Issues in Agriculture		3
AREC 375 - Agricultural Law		3
BSPM 102 - Insects, Science, and Society		3
SOCR 240 - Introductory Soil Science		4
General Education		**24**

Advisor-Approved Electives	**9-11**
General Electives	**9-11**

Note: CHEM 170 + CHEM 370 are equivalent in credit-hours to BIOL 171

Advisor-approved electives (9-11 credits required) - 6 credits must be upper-division coursework

Course	Title	Credits
BSAD 270	Business Communications	3
BSAD 302	Ethics in Business	3
BIOL 453	Ecology	2
BIOL 453L	Ecology Field Studies	2
CHEM 317	Quantitative Analysis	3
CHEM 317L	Quantitative Analysis Lab	2
CBC 401	Medicinal Plant Biochemistry	3
The following electives are offered online through CSU Fort Collins		
AREC 202 - Agricultural and Resource Economics		3
AREC 305 - Agricultural and Resource Enterprise Analysis		3
AREC 310 - Agricultural Marketing		3
AREC 408 - Agricultural Finance		3
AREC 428 - Agricultural Business Management		3
BSPM 201 – Weed Management and Control		3
BSPM 355A – Horticulture Pathology: General Pathology		1
BZ 440 - Plant Physiology		3
HORT 401 – Medicinal and Value-Added Uses of Plant		3
HORT 410 – Postharvest Biology and Technology		3
LIFE 220 - Fundamentals of Ecology		3
SOCR 400 - Soils and Global Change		3

Specific Program Requirements

Students majoring in cannabis biology and chemistry are required to have a cumulative GPA of 2.000 or better in their chemistry and biology courses.