LINCOLN LAND COMMUNITY COLLEGE

BUILDING ILLINOIS' BIOECONOMY CONSORTIUM PROGRAMS

Lincoln Land Community College

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MISSION

The Building Illinois' Bioeconomy (BIB) Consortium strives for the development of a well-trained quality workforce by merging the collective strengths and resources of each partner school with a network of committed regional employers. At the core of the consortium's mission is transforming the workforce to create a talent pipeline and meet industry needs through educational programs leading to bioeconomy careers. The Consortium spans across the state of Illinois, comprising Southern Illinois University Edwardsville (SIUE), Lewis and Clark Community College (L&C), Southeastern Illinois College (SIC), Lincoln Land Community College (LLCC), and Carl Sandburg College (CSC).

POPULATIONS SERVED

The Building Illinois' Bioeconomy Consortium benefits a variety of students. The recent high school graduate can find a worthwhile, engaging career through our bioeconomy aligned programs. Furthermore, our programs focus on providing career tracks for the non-traditional student, such as Trade Adjustment Assistance eligible workers, displaced, underemployed, or unemployed workers, veterans, and underserved minorities.

Building Illinois' Bioeconomy Consortium activities are funded through a $10 million U.S. Department of Labor Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant.

LETTER FROM LINCOLN LAND COMMUNITY COLLEGE PRESIDENT

In 2014 the State of Illinois Economic Development Plan identified seven high-potential industry clusters that are poised for significant job creation through 2025, including agribusiness, biotechnology, advanced materials, and clean energy. The Building Illinois' Bioeconomy Consortium has been tasked with creating unique, forward-thinking career pathways for educating and training Illinois and regional workers for these jobs.

Lincoln Land Community College (LLCC) is pleased to offer new certificates for Agricultural Watershed Technicians, Turf Management, and Landscape Design, as well as an updated curriculum for the Associate in Applied Science (A.A.S.) degree in Horticulture, all made possible through funding for the BIB Consortium from the U.S. Department of Labor's Trade Adjustment Assistance Community College and Career Training grant program. We are excited about these program additions and changes, as these valuable improvements are reflected across current industry standards.

The new certificates offer classroom and hands-on training focused on nutrient loss reduction potential and opportunities, stability of soil sediments, nutrient retention and storage, as well as field water management and water quality. Horticulture students learn best practices for solving the complex problems affecting green spaces and preserving the richness and sustainability of our natural landscape, while also adhering to state and federal regulations. LLCC's suite of programs are designed for individuals with broad agricultural and horticultural interests. From farm owners, operators, and service providers, to the traditional incoming students in environmental science, our programs provide necessary training to succeed in agriculture. Graduates of these programs work for sod farms, nurseries, golf courses, parks, watersheds, and as landscapers and entrepreneurs.

LLCC has been recognized as a top quality postsecondary education institution, available at an affordable price. Our faculty and staff are national leaders in their specialty areas, our accreditations tout the success and quality of our programming, and we continue to develop new, relevant programs such as those that are part of the BIB Consortium.

Charlotte J. Warren, Ph.D.
President
Lincoln Land Community College

"From farm owners, operators, and service providers, to the traditional incoming students in environmental science, our programs provide necessary training to succeed in agriculture."

LETTER FROM BUILDING ILLINOIS' BIOECONOMY CONSORTIUM PROJECT MANAGER

For the past three years, I've had the pleasure of serving as the Project Manager for the Building Illinois' Bioeconomy Consortium. Across the BIB Consortium, our goal is to empower students with the degrees, certificates, and training they need to achieve success in their desired career in the bioeconomy.

One of the first questions we always must answer is, "What is the bioeconomy, anyway?" To quote the specialized literature, "In its broadest sense, the bio-economy addresses the production and use of biological resources for conversion into commercial products, ranging from food and feed to bio-based products and bio-energy." (Institute for European Environmental Policy, 2015)

I tend to think primarily of agriculture, energy, manufacturing, and water, but it's also forestry, fisheries, food processing, and parts of the chemicals and biotechnology sectors, as well as business, management, communications, and education components related to these industries. It's food processing at Prairie Farms and Kraft Foods. It's biofuels production at Green Plains and Center Ethanol, water treatment at Metropolitan Sewer District, and agriculture communications at Osborn Barr. These are all real companies, with real jobs, that our graduates are competitive in filling.

To address these employment needs, the BIB Consortium has created programs within the clusters of bioprocessing, biofuels, water management, restoration ecology, and process maintenance, as well as opportunities to articulate Associate of Applied Science (A.A.S.) degrees offered at community colleges into an innovative and interdisciplinary Integrative Studies Baccalaureate degree offered at SIUE.

We're filling the jobs of today while also preparing for the jobs of tomorrow. We are preparing workers for jobs that can't be outsourced, using homegrown, domestic fuel and products made from sustainable, renewable resources. We have the opportunity to build upon our collective strengths and develop the bioeconomy for the benefit of our students and for our community.

Courtney Breckenridge
Project Manager
Building Illinois' Bioeconomy Consortium

> ***"Across the BIB Consortium, our goal is to empower students with the degrees, certificates, and training they need to achieve success in their desired career in the bioeconomy."***

ABOUT BUILDING ILLINOIS' BIOECONOMY CONSORTIUM

The BIB Consortium is a collaboration between five Illinois postsecondary educational institutions, made possible through funding from a U.S. Department of Labor grant. The Consortium is dedicated to transforming the workforce to create a talent pipeline and meet industry needs through flexible education and training programs that lead to in-demand, skilled, and high-wage jobs in the bioeconomy.

Lewis and Clark Community College

Lincoln Land Community College

Southern Illinois University Edwardsville

Southeastern Illinois College

Carl Sandburg College

Bioprocess
Converting organic matter or waste into products that we use every day, like fuels or plastics

Bioenergy
A form of bioprocessing focused on turning organic matter into fuel

Process Maintenance
Operation of both machine and computer process systems in manufacturing facilities

Water Management
Treatment of waste or drinking water in a government or private facility, as well as in agriculture watersheds

Restoration Ecology
The preservation and restoration of natural environments like forests and plains

ABOUT LINCOLN LAND COMMUNITY COLLEGE

Lincoln Land Community College serves approximately 15,000 individuals annually through credit and non-credit courses. It is the largest community college district in Illinois in terms of land mass, its district comprising all or parts of 15 counties in central Illinois and covering 4,115 square miles. The main campus is in Springfield, and Outreach Centers are located in Jacksonville, Beardstown, Taylorville, and Litchfield. The student body is in proportion of 39 percent over the age of 25 and in proportion of 19 percent minority. The mission of LLCC is to provide district residents with quality educational programs and services that are accessible, affordable, and responsive to individual and community needs.

Certificate of Completion: Agricultural Watershed Technician 1

Certificate of Achievement: Agricultural Watershed Technician 2

Certificate of Achievement: Turf Management

Certificate of Achievement: Landscape Design

Associate in Applied Science: Horticulture

Visit www.llcc.edu/watershed-management or www.llcc.edu/landscape-turf-management to enroll today

ABOUT THE BIOECONOMY

As mentioned in the Federal Activities Report on the Bioeconomy issued in 2016, "bioeconomy" is a popular phrase used broadly in today's agribusiness and energy conversations, and emphasizing the integral role of abundant, sustainable, domestic biomass in the U.S. economy. The bioeconomy can help increase the United States' food and feedstock resources, preserve the nation's water and energy resources, reduce dependence on foreign oil, mitigate CO2, and provide high-paying rural and urban jobs.

The benefits of the bioeconomy in improving the quality of life and creating jobs have been acknowledged both in the United States and abroad. The member countries of the United Nations, including the United States, recognize the environmental and economic potential of bioproducts, biomaterials, biofuels, and renewable chemicals, which are key components of the bioeconomy, in balancing plant growth, industrial processing, water consumption, and the aquaculture life system.

Lincoln Land Community College offers high quality and convenient training to support a skilled workforce contributing to the bioeconomy. The training programs related to the bioeconomy at LLCC, specifically for Agricultural Watershed Technicians as well as pertaining to Turf Management, Landscape Design, and Horticulture, prepare individuals for entry to mid-level positions and provide professional development in the bioeconomy sector.

LLCC leverages community resources including the Lake Springfield Watershed, a designated priority watershed which serves as a student learning laboratory and an outdoor practicum location. In such environments, students have opportunities to understand and put to work conservation practices related to the diagnosis and remediation of nutrient and soil sediment losses and of aquatic issues as well as production agriculture best practices for example the cost and benefit analysis of quality soils and nutrient retention.

Skills learned in LLCC's programs are transferable across the bioeconomy sector and related industries.

CERTIFICATE OF COMPLETION: AGRICULTURAL WATERSHED MANAGEMENT TECHNICIAN I

Duration of studies: 6 months

13 credit hours

COURSES

- AWM-101 Conservation Practice Systems I
- AWM-102 Conservation Practice Systems II
- AWM-103 Agricultural Nutrient Use Efficiency
- AWM-107 Agricultural Watershed Management

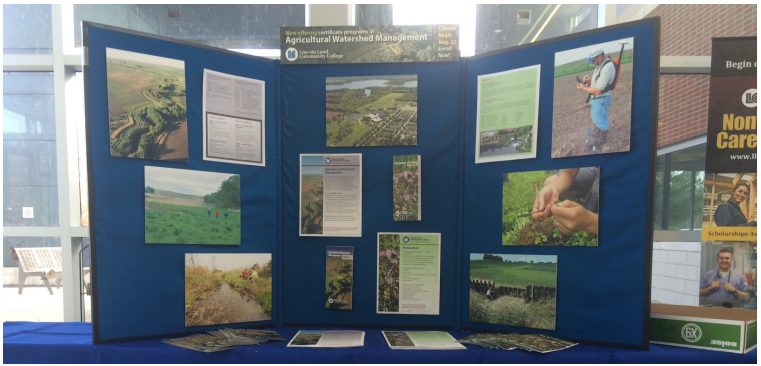
CAREER OPPORTUNITIES

- Agriculture Worker
- Farm Worker
- Agricultural Watershed Worker
- Grounds Maintenance Worker

CERTIFICATE OF ACHIEVEMENT: AGRICULTURAL WATERSHED MANAGEMENT TECHNICIAN II

Duration of studies: 12 months

32 credit hours



COURSES

- AWM-101 Conservation Practice Systems I
- AWM-102 Conservation Practice Systems II
- AWM-103 Agricultural Nutrient Use Efficiency
- AWM-104 Agriculture Readiness for Change
- AWM-105 Agricultural Building Data Management
- AWM-106 Agricultural Sediment Fundamentals
- AWM-107 Agricultural Watershed Management
- AGR-208 Introduction to Agricultural Mechanization
- AFO-208 Applied Skills in Agricultural Mechanization
- ESI-101 Employability Skills

CAREER OPPORTUNITIES

- Agriculture Worker
- Farm Worker
- Agricultural Watershed Worker
- Grounds Maintenance Worker
- Landscape Planner, Designer, or Developer
- Conservationist

CERTIFICATE OF COMPLETION: TURF MANAGEMENT

Duration of studies: 12 months

28 credit hours

COURSES

- HRT-102 Plant Science
- HRT-103 Turf Management I
- HRT-109 Turf Management II
- HRT-202 Pest and Pest Management
- HRT-206 Tree and Shrub Identification
- HRT-208 Landscape Maintenance
- WLM-101 Landscape Lake Ecology
- WLM-102 Landscape Lake Sampling
- WLM-103 Landscape Lake Management

CAREER OPPORTUNITIES

- Agriculture Worker
- Farm Worker
- Nursery or Greenhouse Worker
- Grounds Maintenance Worker
- Pest Control Worker
- Landscape Planner, Designer, or Developer

This program falls under regulations for "Gainful Employment in a Recognized Occupation." LLCC provides the gainful employment information at http://ww3.llcc.edu/ge/ccldtm/01.0605-Gedt.html in compliance with the "Program Integrity" and "Gainful Employment in a Recognized Occupation" regulations as defined by the U.S. Department of Education (34 CFR 668.8).

CERTIFICATE OF COMPLETION: LANDSCAPE DESIGN

Duration of studies: 12 months

26 credit hours

COURSES

- HRT-102 Plant Science
- HRT-202 Pest and Pest Management
- HRT-206 Tree and Shrub Identification
- HRT-207 Landscape Construction
- HRT-208 Landscape Maintenance
- HRT-215 Landscape Design I
- HRT-216 Landscape Design II
- HRT-217 Landscape Design III
- HRT-218 Herbaceous Plant Identification

CAREER OPPORTUNITIES

- Agriculture Worker
- Farm Worker
- Nursery or Greenhouse Worker
- Grounds Maintenance Worker
- Pest Control Worker
- Landscape Planner, Designer, or Developer

ASSOCIATE IN APPLIED SCIENCE: HORTICULTURE

Duration of studies: 24 months

56-63 credit hours

COURSES

Students take courses in English, communication, technical math, chemistry, computer science, agriculture, and employability skills, in addition to agricultural watershed management (AWM), landscape lake management (WLM), and horticulture (HRT) courses outlined on pages 14-15. Students are also required to complete a cooperative education work experience and an agribusiness internship.

CAREER OPPORTUNITIES

- Farm, Nursery, or Greenhouse Manager
- Watershed or Water Treatment Plant Manager
- Grounds Maintenance or Golf Course Supervisor or Manager
- Soil or Plant Specialist
- Landscaping Specialist or Supervisor
- Park Naturalist or Manager
- Environmental Restauration Specialist
- Conservation Specialist

CORE COURSES

AWM-101 Conservation Practice Systems I (4 credit hours) - This course uses surface agricultural conservation activities to effect nutrient loss reduction and soil retention strategies. Techniques covered include integral cover crops, minimum and no-tillage practices, biomass energy crop culture and companion plantings.

AWM-102 Conservation Practice Systems II (3 credit hours) - This course uses sub-surface agricultural water conservation activities to effect nutrient loss reduction and soil retention strategies. Techniques covered include various tile layouts, drainage water management, erosion and run-off control, integration of saturated buffers and bioreactors in nutrient management.

AWM-103 Agricultural Nutrient Use Efficiency (3 credit hours) - This course examines agricultural nutrient use efficiencies under various farm systems. Topics covered include all 17 crop-essential nutrient cycles, water cycle, green manures, soil health, animal manures and waste water, soil Cation Exchange (CEC) and pH effects on plant nutrients and management practices, all with the purpose of reducing nutrient loss and retaining soils.

AWM-104 Agriculture Readiness for Change (2 credit hours) - This course is designed to facilitate role transition from student to beginning agricultural watershed leader in an ever-changing agricultural watershed ecosystem. The concepts of leadership and participatory management, with a focus on power of place and advocacy of agriculture's change, are further developed. Students are encouraged to view agricultural watershed management from very differing backgrounds and perspectives.

AWM-105 Agricultural Building Data Management (3 credit hours) - This course introduces agricultural data management and best management practices. The concepts and integrative practices of voluminous agricultural data management in various hardware and software environments are a major focus of the course.

AWM-106 Agricultural Sediment Fundamentals (4 credit hours) - This course encompasses agricultural sediments from their beginning through utilization, harm, and retention. It trains individuals to optimize soil productivity by minimizing erosion and reducing physical harm from compaction, pollution, and flora losses.

AWM-107 Agricultural Watershed Management (3 credit hours) - This course focuses on a roadmap to the agricultural nutrient and sediment rules, regulations and guidelines, and Best Management Practices of agricultural watershed management. The course introduces students to government agencies and nongovernmental organization to help understand how to practice good stewardship.

WLM-101 Landscape Lake Ecology (3 credit hours) - This course introduces students to cultural landscape lake and basin ecology. Specific aquatic indices such as impacts from organic wastes, industrial chemicals, and point or non-point source pollutants are covered. Students identify a healthy cultural landscape lake. This coursework involves extensive student participation, along with supplemental reading materials and lab presentations.

WLM-102 Landscape Lake Sampling (3 credit hours) - This course prepares students in a variety of sampling protocols for landscape aquatic settings. Toxicity tests and field sampling are taught, discussed, and practiced. Once lake water sampling protocols are mastered, students learn how to interpret results. This course has an in-class and in-field setting. Extensive student participation is required.

WLM-103 Landscape Lake Management (3 credit hours) - This course teaches cultural treatment of landscape lakes, basins, and other impounded water bodies for both adequate enjoyment and environmental protection. This course prepares students to take and pass their Illinois Department of Agriculture aquatic pest control applicator license.

CORE COURSES

HRT-100 Careers in the Horticulture Industry (1 credit hour) - This course deals with the occupations and activities pertaining to the horticulture industry.
HRT-102 Plant Science (3 credit hours) - This course deals with the anatomy, physiology, and growth of the economically important seed-producing plants such as grasses, annuals, woody plants, and vegetables used in horticulture. Included are the interaction of the plant with soil and water as well as the basic requirements for plant growth such as heat, light, water, nutrients' availability, and support.
HRT-103 Turf Management I (3 credit hours) - This course studies the practical aspects in construction, renovation, and maintenance of turf area. Included are identification, growth requirements and use of more commonly available grass types. The advantages of seeding, sodding, sprigging, and plugging are presented.
HRT-106 Soils and Fertilizers (3 credit hours) - This course is designed to give students a basic understanding of soils and growing media used in the horticulture industry. Nutrient needs and fertilizers used for turf, landscape, vegetable, and greenhouse crops are also covered, including site retention of sediments and fertilizers. Use of organic soil amendments and fertilizers is covered.
HRT-109 Turf Management II (3 credit hours) - This course is a continuation of Turf Management I. Turf Management II expands on pest control, renovation, and maintenance of turf. Design and installation of irrigation systems is covered. Specialty turf applications for athletics and ornamental uses of grasses are introduced.
HRT-202 Pest and Pest Management (4 credit hours) - This course provides instruction and practice in the identification and control of common ornamental pests and diseases. It includes instruction in pest identification, pesticide use, and safety and legal aspects of pest control. Integrated pest management practices are stressed.
HRT-206 Tree and Shrub Identification (3 credit hours) - This course studies the identification of commonly used hardy ornamental trees, shrubs, and vines. The growth and maintenance requirements for each species are discussed. Appropriate use of each species in the landscape is presented.
HRT-207 Landscape Construction (3 credit hours) - This course introduces students to current practices for installing plants and materials in a landscape. Operation and care for commonly used power equipment is also covered.
HRT-208 Landscape Maintenance (3 credit hours) - This is an applied course on the basics of woody plant care in the landscape. Topics include watering, fertilization, pest control, and pruning and maintaining structures.
HRT-215 Landscape Design I (2 credit hours) - This course is an applied course intended to present the basic theory and principles of landscape design. Included is the preparation of plans on selected design problems.
HRT-216 Landscape Design II (3 credit hours) - This course is a continuation of Landscape Design I. Students develop complete landscape plans using appropriate symbols and terminology.
HRT-217 Landscape Design III (2 credit hours) - This course is a continuation of Landscape Design I and II. It is intended to improve students' skills in creating designs. This capstone class reinforces students' abilities in making functional attractive outdoor spaces.
HRT-218 Herbaceous Plant Identification (2 credit hours) - This course is designed to introduce students to annual and perennial non-woody plants. Students learn to correctly identify and use these plants in the landscape.
HRT-219 Landscape Sales (3 credit hours) - This course introduces students to skills needed to evaluate, estimate, and prepare bids for landscape projects. Marketing, bidding, and sales presentations are also covered.
HRT-220 Golf Course Operations (3 credit hours) - This capstone course is designed to introduce students to current industry practices used to run a golf course.

PROGRAMS DESIGNED TO FIT STUDENTS' NEEDS AND MARKET DEMAND

Classes are held on the beautiful campus in Springfield or at the additional Outreach Centers in Jacksonville, Beardstown, Taylorville, and Litchfield.

Experienced instructors with industry expertise include current and former employees of various regional specialized companies, providing onsite, real-life experience, validation of skills, and great job contacts.

Financial Aid

Contact a financial aid advisor today for more information. Your financial aid advisor can work with you one-on-one to explore financial aid options and assist you in completing necessary forms.

Enrollment

To enroll at Lincoln Land Community College:

- Complete an admission form and, if desired, apply for financial aid.
- Submit your official high school transcripts or GED score to the Admissions and Records office; take any needed placement tests.
- Attend New Student Orientation.
- Meet with an advisor to select classes and complete registration process.

Transferable Coursework

Credits and courses are transferable across the Building Illinois' Bioeconomy Consortium (BIB) and throughout Illinois system schools. Students have the option to enroll in a 2+2 program to be able to attend two years at LLCC and the last two years at SIUE and obtain an Associate in Applied Science degree in Horticulture as well as a Bachelor's degree in Integrative Studies.

Lawrence Strubhart
Horticulturist,
Lincoln Land Community College
Springfield, IL

"The outdoors were my playground while growing up camping, hunting, fishing and more. Living in the country, farm work was plentiful and enjoyable, so much so it lead to a B.S. degree in General Agriculture and a B.S. degree in Plant and Soil Sciences. During college, I was employed as a student working at Southern Illinois University's poultry farm. After graduating, I held jobs at various positions in the field, including nurseries, greenhouses, landscaping, and finally as the Horticulturalist at Lincoln Land Community College.

I decided to enroll in LLCC's WLM program because, although the knowledge and principles covered in this program weren't entirely new to me due to my 40 years of experience, they clarified, re-enforced, and brought to light newer methods, research, and practices. I've confidently incorporated these learnings into my daily routine and planning to support proposed changes on improving and monitoring the lakes, ponds, and waterways at LLCC."

Chuck Cawley
Division Manager,
Illinois Department of Agriculture
Springfield, IL

"The Agricultural Watershed Management program at Lincoln Land Community College was a perfect fit for me, my background, and my schedule. Working as a Division Manager at the Illinois Department of Agriculture, the program's flexibility allowed me to maintain my full-time job while attending classes during evening hours.

As a farmer, I was attracted to the program by my interest in nutrient management, and learning remedies for nutrient and soil sediment losses. I also looked to the program as a career development opportunity for my work at the Department of Agriculture where I work directly with individuals leading nutrient management research. Through the program, I was able to increase my knowledge of the entities involved in nutrient management, their interests and objectives, as well as learn about practical examples of current applications and practices presented throughout the courses. The program has helped me become a better farmer and employee."

CONTACT US

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SOUTHERN ILLINOIS UNIVERSITY EDWARDSVILLE

LEWIS&CLARK COMMUNITY COLLEGE
Empowering People

SOUTHEASTERN ILLINOIS COLLEGE

Lincoln Land Community College

CARL SANDBURG COLLEGE

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