

LEWIS AND CLARK COMMUNITY COLLEGE

BUILDING ILLINOIS'
BIOECONOMY
CONSORTIUM PROGRAMS



BUILDING ILLINOIS'
BIOECONOMY CONSORTIUM

THE BUILDING ILLINOIS' BIOECONOMY CONSORTIUM

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.



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LETTER FROM LEWIS AND CLARK COMMUNITY COLLEGE PRESIDENT

In 2014, the State of Illinois Economic Development Plan identified seven high-potential industry clusters that were poised for significant job creation through 2025. These industries include biotechnical, advanced materials, clean energy, and agribusiness. The Building Illinois' Bioeconomy Consortium has been tasked with creating a unique, forward-thinking career path as a foundation for training Illinois workers to fill these jobs.

Lewis and Clark Community College's participation in the BIB Consortium includes partnerships with fellow Illinois colleges, universities, and bio-based employers to expand workforce development through job training and upgrading worker skills to support this emerging bioeconomy.

L&C's involvement in the BIB Consortium has focused heavily on the Process Operations Technology and Restoration Ecology sectors of work. We've seen great success and perseverance from our students in both of those career programs.

L&C's Restoration Ecology program is preparing students to enter careers in sustainable landscaping and restoration, meeting the needs of a wide range of employers who are rapidly joining the "green" and ecologically-minded environment.

L&C PTEC students of all ages and backgrounds are learning the skills they need to join the petroleum and manufacturing workforce, and engaging in unique hands-on opportunities at such advance facilities as the National Corn-to-Ethanol Research Center to learn the job in a safe and controlled environment.

L&C's education model goes a step further by connecting students directly to useful, real world internships that position them ahead of the pack when they eventually enter the workforce as full-time employees. Setting our students up for success in the bioeconomy is our top priority as part of the BIB Consortium.

Being a part of the effort to build a skilled workforce is one of the many reasons I am proud Lewis and Clark Community College is a partner in the BIB Consortium. Working with capable students and supportive partners and employers, L&C strives to fulfill its mission to empower students with the necessary resources to succeed in today's business landscape.

Dr. Dale Chapman
President
Lewis and Clark Community College

“ Setting our students up for success in the bioeconomy is our top priority as part of the BIB Consortium. ”



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

“Our goal is to empower students with the degrees, certificates, and training they need to achieve success...”



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 LEWIS AND CLARK COMMUNITY COLLEGE

Lewis and Clark Community College is a two-year higher education institution with multiple campuses, a river research center, a humanities center, training centers, and the Community Education Centers, located throughout a large college district reaching across seven counties. Offering more than 40 associate degrees and 80 certificates to approximately 15,000 full-time or part-time students, and engaging in more than 60 2+2 and articulation agreements with four-year institutions, Lewis and Clark Community College has something for just about anyone. Additionally, L&C demonstrates, through its programs and activities, commitment to sustainability, carbon neutrality, and historic preservation.

**Certificate of Completion:
Process Operations Technology – Bioprocess**

**Certificate of Proficiency:
Process Operations Technology**

**Associate in Applied Science :
Process Operations Technology -
Bioprocess, Biochem, or Petroleum**

**Certificates of Completion:
Sustainable Urban Horticulture,
Green Roof Specialist,
or Storm Water Management**

**Certificate of Proficiency:
Restoration Ecology**

**Associate in Applied Science:
Restoration Ecology**

Visit lc.edu/program/processop OR lc.edu/program/restorationecology to enroll.

ABOUT BIOENERGY AND 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 energy conversation, and emphasizing the integral role of abundant, sustainable, domestic biomass in the U.S. economy. The bioeconomy can reduce the United States’ 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, have committed to the use of bio-based fuel in conjunction with higher bio-based blends, and recognize the environmental and economic potential for bioproducts, biomaterials, and renewable chemicals which are key components of the bioeconomy.

Lewis and Clark Community College provides high quality and convenient programs to support a well-trained workforce contributing to the bioeconomy.

The training programs related to the bioeconomy at Lewis and Clark Community College, specifically those pertaining to bioprocess and restoration ecology, prepare individuals for entry to mid-level positions and provide professional development in the bioeconomy sector.

Skills learned in the Lewis and Clark Community College’s programs are transferable across the bioeconomy sector and related industries.



BIB PROGRAMS AT LEWIS AND CLARK COMMUNITY COLLEGE

ABOUT PROCESS OPERATIONS TECHNOLOGY & RESTORATION ECOLOGY PROGRAMS

Lewis and Clark Community College offers two types of programs related to the bioeconomy, each with possibilities of stackable credentialing, from certificate level to Associate of Applied Science (A.A.S) degree, and of hands-on experiences in professional settings added to classroom learning and contributing to graduates' employability.

PROCESS OPERATIONS TECHNOLOGY

L&C's Process Operations Technology (PTEC) program was developed in collaboration with ConocoPhillips in Wood River, Illinois, and in consultation with the Sigma-Aldrich Corporation headquartered in St. Louis, Missouri and the Center for the Advancement of Process Technology in the Gulf Coast region. Completion of the program's various credentialing options results in a high probability of placement within the chemical, oil and gas exploration, and production and power generation industries.



RESTORATION ECOLOGY

L&C's Restoration Ecology program emphasizes skills centered on environmentally, economically, and socially sustainable practices, as well as the importance of critical thinking, communication, and problem-solving skills. Classroom learning and hands-on training help prepare students for jobs linked to establishing, management, and conservation of natural areas, wetlands, and sustainable urban environments.



BIB PROGRAMS AT LEWIS AND CLARK COMMUNITY COLLEGE

CERTIFICATE OF COMPLETION: PROCESS OPERATIONS TECHNOLOGY – BIOPROCESS

6 months duration of studies

16 credit hours



COURSES

- PRCS-111 Introduction to Biofuels
- PRCS-121 Ethanol Production
- PRCS-133 Process Technology Equipment I
- PRCS-134 Process Technology Equipment II
- PRCS-135 Safety, Health and Environment
- PRCS-151 Process Instrumentation Control I

CAREER OPPORTUNITIES

- Plant Operator
- Process Operator
- Plant Technician
- Process Technician

BIB PROGRAMS AT LEWIS AND CLARK COMMUNITY COLLEGE

CERTIFICATE OF PROFICIENCY: PROCESS OPERATIONS TECHNOLOGY

18 months duration of studies

41.5 credit hours



COURSES

Students take courses in chemistry or biochemistry, physics, mathematics, and fire safety and emergency response, in addition to the process operations technology coursework outlined on page 16.

CAREER OPPORTUNITIES

- Plant Operator
- Process Operator
- Plant Technician
- Process Technician
- Manufacturing Technician
- Maintenance Technician

BIB PROGRAMS AT LEWIS AND CLARK COMMUNITY COLLEGE

ASSOCIATE IN APPLIED SCIENCE: PROCESS OPERATIONS TECHNOLOGY – BIOPROCESS, BIOCHEM, OR PETROLEUM

2 years duration of studies

Approximately 60 credit hours



TRYDARRELL WARD - OPERATOR IN TRAINING, PHILLIPS 66 - ROXANA, IL

I was at the point in my life where I wanted a career instead of a job. Before the PTEC program I was a manager at a grocery store. I love my new job. I enjoy being up and active. It allows me to spend more time with my family.

COURSES

Students take courses in technical writing, oral communication, technical math, and various areas of chemistry and biochemistry, business and economics, and computer technology, as well as fire safety and emergency response, in addition to the process operations technology coursework outlined on page 16.

CAREER OPPORTUNITIES

- Plant Operator or Technician
- Process Operator or Technician
- Instrumentation Technician
- Manufacturing Technician
- Maintenance Technician
- Production Processor

BIB PROGRAMS AT LEWIS AND CLARK COMMUNITY COLLEGE

CERTIFICATES OF COMPLETION

SUSTAINABLE URBAN HORTICULTURE

- 6 months duration of studies
- 6 credit hours

COURSES

- STWR-100 Introduction to Storm Water
- STWR-101 EPA Rules and Regulations
- STWR-102 Watershed Dynamics
- STWR-103 Erosion and Sedimentation Control
- STWR-104 SWPP Development and Management
- STWR-105 Job Site Inspections

GREEN ROOF SPECIALIST

- 6 months duration of studies
- 12 credit hours

COURSES

- ADCG-133 Introduction to Architecture
- ECOL-134 Native Plants in the Landscape
- LAND-130 Introduction to Landscape Architecture
- STWR-100 Introduction to Storm Water

STORM WATER MANAGEMENT

- 6 months duration of studies
- 13 credit hours

COURSES

- ECOL-101 Plant Growth and Development
- ECOL-102 Plant Reproduction
- ECOL-131 Introductory Soils
- ECOL-134 Native Plants in the Landscape

CAREER OPPORTUNITIES

Various opportunities in landscaping, conservation, watershed science, water treatment

BIB PROGRAMS AT LEWIS AND CLARK COMMUNITY COLLEGE

CERTIFICATE OF PROFICIENCY: RESTORATION ECOLOGY

18 months duration of studies

35 credit hours



COURSES

Students take courses in the areas of geography, biology, and business, in addition to the restoration ecology coursework outlined on page 16 and additional ecology electives.

CAREER OPPORTUNITIES

- Landscaping Specialist
- Park Naturalist
- Greenhouse Manager
- Watershed Manager
- Conservation Specialist
- Water Treatment Plant Manager

BIB PROGRAMS AT LEWIS AND CLARK COMMUNITY COLLEGE

ASSOCIATE IN APPLIED SCIENCE: RESTORATION ECOLOGY

2 years duration of studies

Approximately 60 credit hours



COURSES

Students take courses in technical writing, oral communication, technical math, and various areas of chemistry and biochemistry, business and economics, and computer technology, in addition to the restoration ecology coursework outlined on page 16 and additional ecology electives.

CAREER OPPORTUNITIES

- Plant Operator or Technician
- Process Operator or Technician
- Instrumentation Technician
- Manufacturing Technician
- Maintenance Technician
- Production Processor

CORE COURSES

PROCESS OPERATION TECHNOLOGY CORE COURSES

- PRCS-111 Introduction to Biofuels
- PRCS-121 Ethanol Production
- PRCS-131 Introduction to Process Technology
- PRCS-133 Process Technology Equipment I
- PRCS-134 Process Technology Equipment II
- PRCS-135 Safety, Health and Environment
- PRCS-151 Process Instrumentation Control I
- PRCS-231 Quality Control
- PRCS-252 Process Instrumentation Control II
- PRCS-255 Process Technology Systems
- PRCS-256 Process Technology Operations
- PRCS-265 Process Troubleshooting
- PRCS-271 Process Technology Internship

RESTORATION ECOLOGY CORE COURSES

- ECOL-101 Plant Growth & Development
- ECOL-102 Plant Reproduction
- ECOL-131 Introductory Soils
- ECOL-132 Intro to Restoration Ecology
- ECOL-134 Native Plants in the Landscape
- ECOL-238 Field Practicum
- ECOL-271 Internship

STORM WATER CORE COURSES

- STWR-100 Introduction to Storm Water
- STWR-101 EPA Rules and Regulations
- STWR-102 Watershed Dynamics
- STWR-103 Erosion and Sedimentation Control
- STWR-104 SWPP Development and Management
- STWR-105 Job Site Inspections

COURSES DESIGNED TO FIT STUDENTS' NEEDS AND MARKET DEMAND

Classes are held on the beautiful Godfrey campus and at the adjacent National Great Rivers Research and Education Center (NGRRECSM), or at the additional campuses in Edwardsville, East Alton, or Alton.

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



Financial Aid

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



Transferable Coursework

Credits and courses are transferable across the Building Illinois' Bioeconomy Consortium (BIB) and throughout Illinois system schools.



Enrollment

Enrolling at Lewis and Clark is a simple four step process:

- Complete an admission form
- Submit your official high school transcripts
- Take a placement test
- Meet with an advisor

SUCCESS STORIES



"I was always interested in process technology, and when I lost my last job I decided to check out the programs offered at Lewis and Clark Community College. When I saw the programs and opportunities offered at L&C, I decided to enroll and fulfill my passion to master a new skill at my age. Today, I'm working at Koch Industries as an Operations Technician and I love the work I do."

**John Ritter - Operations Technician,
Koch Industries - Wichita, KS**



"I wanted to further my career and background in Horticulture and landscaping. I enjoy working outside with plants and saw that the Restoration Ecology program at Lewis and Clark Community College would offer me the skills I needed. I am currently a Grounds Supervisor and am involved in Employment Involvement Unit Safety, the Pesticide Use Licensing Program and Professional Grounds Management Society."

**Laura Perry - Supervisor at Aramark/
Boeing Leadership Center- Florissant, MO**

CONTACT US

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Visit lc.edu/program/processop OR lc.edu/program/restorationecology to enroll

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