PROGRAM DETAILS

"This course has contributed to my interest of biotechnology as well as other biological related careers and subjects"

PREPARING STUDENTS FOR COLLEGE & CAREER

- 4 years of College & Academic Planning
- 2 Technical Laboratory Classes
  - Foundations of Biotechnology
  - Applications of Biotechnology
  - 15 weeks each; 2 days/week
- Early College Credit (AP or dual enrollment)
- 100 hours of work-based learning

November - March
2:30 - 5:15 PM

APPLICATION SELECTION

No academic prerequisites

Freshmen students are eligible to apply

Qualified applicants will be entered into a lottery by technical pathway to determine final student selection. Student enrollment is allocated equitably by high school across the district.

Rolling admissions is available for technical pathways with vacancies.

PROGRAM CONTACTS

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Emily Lehman
Director of Innovation Pathways

Kelsey Lamoureux
Career & Partnership Specialist

BioBuilder and Worcester Public Schools

CERTIFICATE IN BIOTECHNOLOGY AND BIOMANUFACTURING

HELPING STUDENTS DEVELOP CAREER AND TECHNICAL SKILLS THROUGH THE STATE'S INNOVATION PATHWAYS PROGRAM

Students apply their growing understanding and developing technical skill to a semester-long lab experiment, integrating industry-standard professional practices and ways of thinking into their research.

PROGRAM PARTNERS INCLUDE

BioBuilder · Quinsigamond Community College · TWIST

SURVEY DATA

- 83% — Can describe the flow of genetic information from DNA through RNA to proteins
- 100% — Know how to measure the concentration of bacterial cells in liquid culture
- 50% — Gained confidence in their communcation skills
- 100% — Are more comfortable working in teams or collaborating with classmates
- 100% — Agree that this course has influenced what they want to do in the future

TECHNICAL CLASS 1

This foundational course familiarizes students with the technical and conceptual underpinnings of 21st century biotechnology. Students gain proficiency with essential laboratory tools and skills that are required for success in today's biotechnology industry.

TECHNICAL CLASS 2

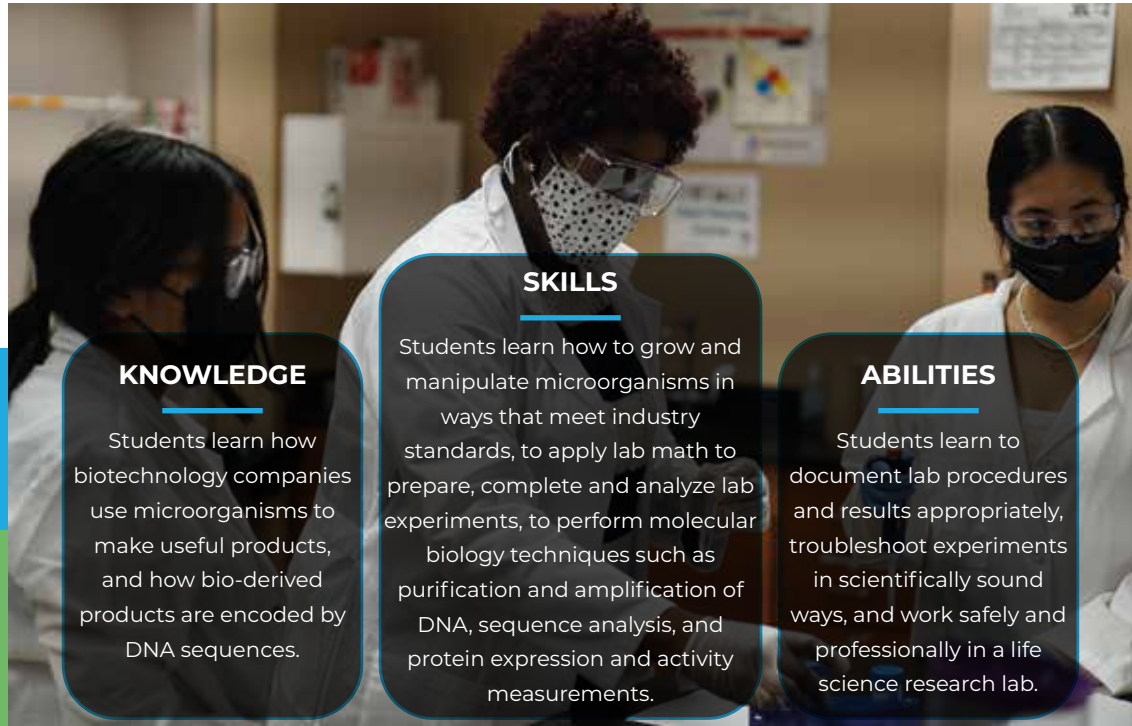
This advanced class uses pre-existing BioBuilder curriculum in bio-design and advanced manufacturing equipment to scale production of an enzyme. Students learn to execute advanced lab protocols and collaboratively problem-solve.

LABORATORY TRAINING INCLUDES

- Micropipetting
- Viability assay
- DNA isolation
- Sterile technique
- DNA sequencing
- Dilution of liquids
- Acrylamide gel electrophoresis
- Preparation of solutions from powders
- Quantitative analysis of enzymatic activity
- Chemical induction of bacterial cells to overproduce an enzyme
- Agarose gel electrophoresis
- Ni-NTA protein purification
- Bradford protein assay
- Restriction digests
- Sequence analysis
- PCR

PREPROFESSIONAL ACTIVITIES INCLUDE

- Informational interviews
- Career events and field trips
- Notebook keeping
- Lab math



KNOWLEDGE

Students learn how biotechnology companies use microorganisms to make useful products, and how bio-derived products are encoded by DNA sequences.

SKILLS

Students learn how to grow and manipulate microorganisms in ways that meet industry standards, to apply lab math to prepare, complete and analyze lab experiments, to perform molecular biology techniques such as purification and amplification of DNA, sequence analysis, and protein expression and activity measurements.

ABILITIES

Students learn to document lab procedures and results appropriately, troubleshoot experiments in scientifically sound ways, and work safely and professionally in a life science research lab.