GRADUATE CERTIFICATE IN MICROBIOME SCIENCE AND ENGINEERING

This graduate certificate provides a foundation in the concepts and methods of microbiome science and engineering and provides perspectives on the applications of those fundamentals to a range of topics in environmental, animal and human, plant, and industrial contexts.

Students interested in graduate work should refer to the Graduate and Professional Bulletin (https://catalog.colostate.edu/general-catalog/graduate-bulletin/).

Learning Objectives

Students successfully completing this certificate will be able to:

1. Describe microbiomes, and compare/contrast microbiomes to single microbial species in terms of function;
2. Explain current methods for characterizing microbiomes, including the information obtained and the limitations of the methods;
3. Describe the role of microbiomes in human, animal, plant, or industrial systems and the functional interactions between microbiomes and their hosts;
4. Integrate concepts from microbiology, ecology, and physiology in the context of microbiome function; and
5. Apply knowledge of microbiome structure and function to propose methods of engineering the microbiome behavior.

Requirements
Effective Fall 2024

Additional coursework may be required due to prerequisites.

Code	Title	Credits
Required Course		
Select one course from the following:		3
AB 511	Microbiome of Plant Systems	
ANEQ 505	Microbiome of Animal Systems	
Select a minimum of 6 credits from the following with at least one course (not previously taken) from each Group.		6
Group A. Experimental Methods and Data Analysis		
AB 511	Microbiome of Plant Systems	
ANEQ 505	Microbiome of Animal Systems	
CIVE 533/ BIOM 533	Biomolecular Tools for Engineers	
MIP 545	Microbial Metagenomics/Genomics Data Analysis	
MIP 565/BZ 565	Next Generation Sequencing Platform/ Libraries	
MIP 570	Functional Genomics	
SOCR 545	Current Methods in Microbial Genomics	
Group B: Microbiomes in Context		
AB 511	Microbiome of Plant Systems	
ANEQ 505	Microbiome of Animal Systems	
FSHN 650C	Recent Developments in Human Nutrition: Genomic, Proteomics, and Metabolomics	
FTEC 578/ HORT 578	Phytochemicals and Probiotics for Health	
Program Total Credits:		**9**

*This certificate may have courses in common with other graduate certificates. A student may earn more than one certificate, but a given course may be counted only in one certificate.