

## Microbial physiology and metabolism

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### Course Outcome:

Upon successful completion of this course on Microbial physiology and metabolism, students will be able to:

#### 1. Remember:

- Recall the different environmental factors that affect microbial growth and understand how microorganisms respond to changes in their environment.
- Identify the different pathways of aerobic and anaerobic respiration, fermentation, chemolithotrophic, and phototrophic metabolism in microorganisms.
- Recognize the importance of nitrogen and sulfur metabolism in microbial physiology.

#### 2. Understand:

- Explain the mechanisms of aerobic and anaerobic respiration, fermentation, chemolithotrophic, and phototrophic metabolism in microorganisms.
- Analyze the assimilatory and dissimilatory pathways involved in nitrogen and sulfur metabolism in microorganisms.

#### 3. Apply:

- Apply the principles of microbial physiology and metabolism to predict the growth and metabolism of microorganisms in different environmental conditions.
- Analyze and interpret experimental data related to microbial growth and metabolism in various environments.

#### 4. Analyze:

- Critically evaluate the role of microbial metabolism in biogeochemical cycles and environmental processes.
- Compare and contrast the different pathways of nitrogen and sulfur metabolism in microorganisms.

#### 5. Evaluate:

- Assess the impact of microbial metabolism on human health, agriculture, and the environment.
- Propose strategies to manipulate microbial metabolism for industrial and environmental applications.

#### 6. Create:

- Design experiments to study the effect of environmental factors on microbial growth and metabolism.
- Develop hypotheses and research proposals related to microbial physiology and metabolism.

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