



# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## Shri Vaishnav Institute of Science

### Department of Life Science

#### Generic Electives (GE) Under Graduate Courses

#### SEMESTER V

COURSE CODE	Category	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
<b>BTUGE03</b>	<b>GE</b>	<b>Microbial Analysis and its Applications</b>	60	20	20	0	0	3	0	0	3

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

**\*Teacher Assessment shall be based following components: Quiz / Assignment / Project / Participation in Class, given that no component shall exceed more than 10 marks.**

#### Course Objectives:

1. To give a comprehensive idea about the important classes of microorganisms and their importance
2. To gain a fundamental and practical understanding in the use of microbiological analysis for water, food, pharmaceuticals and in environmental samples.

#### Course Outcomes:

1. Student will be able to understand the salient features of microorganisms, their importance in nature and their control.
2. Student will be able to show the ability to efficiently and independently use and interpret data from microbiological analysis of the given samples.


#### UNIT-I –Introduction to microorganisms


Discovery of microorganisms and their significance; Classification of microorganisms; General characteristics of bacteria, viruses, algae, fungi and protozoa


#### UNIT – II Microbial nutrition, growth and control

Nutritional classes of bacteria; Types of media and cultivation of bacteria; Factors affecting growth, Growth curve.

Control of microorganisms - Physical methods [temperature, filtration, radiation]; Chemical methods for disinfection and sanitation

  
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#### BTUGE03 Microbial Analysis and its Applications

##### UNIT– III Methods of microbial analysis

Measurement of bacterial growth; Microbial Limit Test, Sterility Test, Bacterial Endotoxin Test, Phenol Coefficient Test, Most Probable Number, SPC, MIC, Bioassays, tests for antibacterial, antifungal and antiviral activity.

##### UNIT - IV Rapid methods of microbial analysis


Immunological methods; fluorescent, radio immunoassay, ELISA and nucleic acid probes and PCR (Polymerized chain reactions) and Biosensors


##### UNIT - V Quality Control and Quality Assurance

GMP, GLP, Validation, ISO and HACCP, FSSAI, National Standard Bodies, Testing Laboratories.

##### BOOKS:

1. Cappuccino, J. G., & Welsh, C. (2016). Microbiology: a Laboratory Manual. Benjamin-Cummings Publishing Company.
2. Collins, C. H., Lyne, P. M., Grange, J. M., & Falkinham III, J. (2004). Collins and Lyne's Microbiological Methods (8th Ed.). Arnolds.
3. Matthai, W., Berg, C. Y., & Black, J. G. (2005). Microbiology, Principles and Explorations. Boston, MA: John Wiley & Sons.
4. Pelczar, M. J., Reid, R. D., & Chan, E. C. (2001). Microbiology (5th Ed.). New York: McGraw-Hill.
5. Tille, P. M., & Forbes, B. A., Bailey & Scott's Diagnostic Microbiology. (2018) 14th Edition
6. Willey, J. M., Sherwood, L., Woolverton, C. J., Prescott, L. M., & Willey, J. M. (2011). Prescott's Microbiology (8th Ed, New York: McGraw-Hill.

  
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