



# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## Shri Vaishnav Institute of Science

### Department of Life Science

#### Generic Elective (GE) Undergraduate Courses

#### Semester II

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*				
BTUG202	GE	<b>Introduction to Vaccines</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. Students will understand the basics of Immune system and Immunity.
2. Know about History of Vaccine development.
3. Knowledge about various approaches of vaccine development.

#### Course Outcomes:

1. Students will understand the basics Immune system and Immunity.
2. Students will get insights into approaches to Vaccine development.

#### Unit 1:

**FUNDAMENTAL CONCEPTS AND OVERVIEW OF THE IMMUNE SYSTEM:** Immune cells: Cells of the Immune System: B and T Lymphocytes; T-cell sub-sets. Immune organs: Organs of immune system, Primary lymphoid organs (Bone marrow and Thymus); Secondary lymphoid organs (lymph nodes, spleen and mucosal-associated lymphoid tissue).

#### Unit 2:

**TYPES OF IMMUNITY:** Innate Immunity: Principles and components, Adaptive Immunity: Principles and components.



# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## Shri Vaishnav Institute of Science

### Department of Life Science

#### Generic Elective (GE) Undergraduate Courses

#### BTUG202 Introduction to Vaccines

##### Unit 3:

ANTIGEN- ANTIBODY: Antigens: Immunogenicity versus Antigenicity, Factors influencing immunogenicity, immunogens, haptens; Epitopes Antibodies: Basic structure, Antigen Antibody interactions.

##### Unit 4:

BASICS OF VACCINE DEVELOPMENT: Active and passive immunization; live, killed, attenuated, subunit vaccines, Adjuvants: vaccine delivery systems.

##### Unit 5:

VACCINE TECHNOLOGY: Role and properties of adjuvants, recombinant DNA and protein-based vaccines, plant-based vaccines, reverse vaccinology; peptide vaccines, conjugate vaccines; antibody genes and antibody engineering: chimeric, generation of monoclonal antibodies, hybrid monoclonal antibodies; dendritic cell-based vaccines, vaccine against cancer, T cell based vaccine, edible vaccine and therapeutic vaccine.

##### Books:

1. Vaccines. 6th Edition, Stanley Plotkin Walter Orenstein Paul Offit.
2. Kuby Immunology. Thomas J. Kindt, Richard A. Goldsby, Barbara A. Osborne, Janis Kuby. 8. Immunology. 8th Edition, David Male Jonathan Brostoff David Roth Ivan Roitt.
3. New Generation Vaccines. Fourth Edition, Myrone M. Levine, Myron M. Levine, Gordon Dougan, Michael F. Good, Margaret A. Liu , Gary J. Nabel , James P. Nataro, Rino Rappuoli.