



College of Veterinary Science and Animal Husbandry Kamdhenu University, Bhuj (Kutch)



DEPARTMENT OF VETERINARY MICROBIOLOGY

About Department

The Department of Veterinary Microbiology was established in accordance with VCI-MSVE 2016 regulations with an objectives of under-graduate teaching by providing necessary infrastructure facilities and laboratory instruments and Post-graduate teaching and research as per ICAR norms. At present the department is functioning as part of college. The Microbiology subject having intermediary role with basic sciences and clinical subjects as well as having broad applications like processing of various clinical samples, disease diagnosis at clinics. It has practical applications at Livestock Research Station and also supports field veterinarians. and farmers for livestock disease diagnosis. Kutch district has a remarkable livestock population and having scope to record the major infectious diseases. In future, department will provide laboratory facilities for microbial isolation, identification, biochemical characterization and antibiotic sensitivity of various clinical samples received from Veterinary Clinical Complex of college and field. Also, this department will provide well-equipped laboratory facilities for bacteriological, virological, immunological, and mycological examination of clinical samples, to support both academic and field based research.

Faculty Details

	Name:	Dr. Pushpaben Maheshsbhai Makwana
	Designation:	Associate Professor & Head (Additional responsibility)
	Qualification:	Ph.D.
	Experience:	16 Years
	PG Students Guided:	02 (M.V. Sc)
	E Mail:	pmmakwana@kamdhenuuni.edu.in hodvmcbhuj@kamdhenuuni.edu.in
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Postgraduate Students Guided

Sr. No.	Thesis Title	Major Advisor	Year of Submission
1.	Detection of virulence associated genes of <i>Staphylococcus aureus</i> from bovine clinical and subclinical mastitis	Dr. P. M. Makwana	2023
2.	Isolation, identification and virulence gene detection of <i>Escherichia coli</i> O157:H7 from faecal samples of dogs	Dr. P. M. Makwana	2022

Summary of Publications

Sr. No.	Details	Numbers
1.	Research Paper (National Journal)	20
2.	Research Paper (International Journal)	17
3.	Short Communications	--
4.	Recommendations	03
5.	Book/ Book chapter	03

6.	Training Manual / Practical Manual	08
7.	Popular articles	12
8.	Abstracts published	28
9.	Gene Bank Submission	19

Seminar/ Training/Research projects/Awards

Sr. No.	Details	Number
1.	National seminar/conferences/Symposium participated	23
2.	Workshops participated/attended	04
3.	Training organized as co-organizing secretary/ member	03
4.	No. of Training Participated 21 days (HRDC/CAFT-ICAR)	04
5.	No. of Research Projects	
	Principle Investigator (PI)	02
	Co-Principle Investigator (Co-PI)	08
6.	Best Poster Presentation Award– Co-author during VI annual convention of SVSBT and national symposium, College of Veterinary & Animal Science, Navania, Vallabh Nagar, Udaipur (Rajivas, Bikaner).	01
7.	Best poster presentation award – Co-author 3 rd Annual Convention of Veterinary internal & Preventive Medicine (VIPM), Dept. of Veterinary Medicine, College of Vet. Sci. & A.H., Anand, KU, Gandhinagar.	01

Other duties

1.	Worked as Assistant Rector for Girls hostel, COVSAH, Navsari
2.	Member of SC/ST cell at College level, COVSAH, Navsari
3.	Member of Anti- Ragging Cell at COVSAH, Navsari

Name	Dr. Mehulkumar Dharmabhai Shrimali		
Designation	Assistant Professor		
Qualification	Ph. D.		
Contact No.	8140924405		
Email ID	shrimali.vets@kamdhenuuni.edu.in shrimali.vets@gmail.com		
Joining date	As a SRA(VO) - 10.03.2011 As an Assistant Professor – 15.03.2024		
Professional Experience	More than 14 Years		
Job profile	Teaching, Research, Extension		
Exams cleared	NET, CCC+ (SPIPA, Mehsana)		
Publications	Teaching Manual:05	Books/Booklets: 03	
	ASCAD Training Manual:06	Award:02	
	Research Papers: More than 25	Popular article - 04	
Recommendations	For Scientific Community: 04		
Departmental Research	As Co-PI-04		
Competence building	21days training (Online): 01		
	Seminar/Symposium/Conference: 10		

	Short courses/Training: 01
Professional Membership	Gujarat Veterinary Council, Gandhinagar (GVC Reg.No.2722)
	Vets Alumni Association Sardarkrushinagar (VAAS Reg. No. 241)
	All Gujarat Veterinarians' Social Security Trust (AGVSST Reg. No. 2148)
	Gujarat Association for Agricultural Scientist (GAAS Reg. No.2982)

	Name:	Thakor Akashkumar Kanaksinh
	Designation:	Assistant Professor
	Qualification:	M.V.Sc.
	Experience:	1.5 Years
	E Mail:	akashthakore@kamdhenuuni.edu.in
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Name	Dr. Bhaveshkumar R. Pandor		
Designation	Assistant Professor		
Qualification	Ph.D. (Veterinary Microbiology)		
Contact No.	8128140736		
Email ID	bhaveshpandor@kamdhenuuni.edu.in		
Joining date	31-05-2025		
Job profile	Teaching, Research, Extension		
Publication	Teaching Manual: 01	Chapters in Book: 01	
	Research Papers: 03	Vernacular Articles: 04	
	Abstracts: 09		
Competence building	Seminar/Symposium/Conference: 8		
Professional Membership	Vets Alumni Association Sardar Krushinagar (VAAS)		
	All Gujarat Veterinarians' Social Security Trust (AGVSST)		
	Society of Veterinary Sciences and Biotechnology (SVSBT)		
	Gujarat Veterinary Council (GVC)		

UG Academics

UG Course (As per VCI MSVE-2016 course curriculum)

Sr. No.	Course offered in Second Professional Year	Credits Hours
1	Veterinary Microbiology	3+2

UG Syllabus – Second Professional year, B.V.Sc. & A.H.

Theory

Unit	Contents
Unit 1	General and Systematic Veterinary Bacteriology General Bacteriology: Introduction and history of Microbiology, Classification and nomenclature of bacteria, Microscopy and Micrometry, Bacterial stains and techniques, Structure and morphology of bacteria, Growth and nutritional requirement of aerobic and anaerobic bacteria, Normal, opportunistic and saprophytic bacterial flora, Types and sources of infection, method of transmission of infection, Pathogenicity, virulence, determinants of exotoxins, antitoxins, toxoids, Bacterial genetics (Mutation, Transformation, Transduction and Conjugation) and plasmids, Antibiotic resistance. Systematic Bacteriology: Study of the following bacteria in relation to isolation, growth, cultural, morphological, biochemical and antigenic characteristics, epidemiology and pathogenesis, pathogenicity, diagnosis, prevention and control of bacterial diseases caused by following bacteria: <i>Staphylococcus</i>, <i>Streptococcus</i>, <i>Corynebacterium</i>, <i>Trueperella</i>, <i>Rhodococcus</i>, <i>Listeria</i>, <i>Erysipelothrix</i>, <i>Bacillus</i>, <i>Mycobacterium</i>, <i>Clostridium</i>, <i>Actinomyces</i>, <i>Nocardia</i>, <i>Streptomyces</i>, <i>Dermatophilus</i>, <i>E.coli</i>, <i>Klebsiella</i>, <i>Salmonella</i>, <i>Yersinia</i>, <i>Proteus</i>, <i>Pseudomonas</i>, <i>Burkholderia</i>, <i>Pasteurella</i>, <i>Mannheimia</i>, <i>Actinobacillus</i>, <i>Haemophilus</i>, <i>Brucella</i>, <i>Vibrio</i>, <i>Campylobacter</i>, <i>Bordetella</i>, <i>Moraxella</i>, <i>Bacteriodes</i>, <i>Dichlobacteria</i>, <i>Fusobacterium</i>, <i>Leptospira</i>, other <i>Spirochaetes</i>, <i>Mycoplasma</i>, <i>Coxiella</i>, <i>Neorickettsia</i>, <i>Ehrlichia</i>, <i>Anaplasma</i>, <i>Rickettsia</i>, <i>Chlamydia</i>, <i>Chlamydophila</i>, Emerging, re-emerging and transboundary bacterial pathogens.
Unit 2	Veterinary Mycology Introduction, classification, general properties of fungi, Growth and Reproduction of fungi, Study of following important pathogenic fungi in relation to their isolation, growth, morphological, cultural, biochemical and antigenic characteristics, epidemiology, pathogenesis, diagnosis and control of fungal diseases caused by following genera: <i>Candida</i>, <i>Cryptococcus</i>, <i>Aspergillus</i>, <i>Penicillium</i>, <i>Dermatophytes</i>, <i>Malassezia</i>, Dimorphic fungi, <i>Rhinosporidium</i>, <i>Sporotrichum</i>, <i>Mycetoma</i>, <i>Zygomycetes</i>, Mycotic mastitis, mycotic abortion, Mycotoxicoses.
Unit 3	Microbial Biotechnology Basic concepts and scope of Recombinant DNA technology, Gene cloning, Cloning vectors, expression vectors, Transformation, transfection, Southern, Northern and Western blotting, Bioinformatics, Gene banks, Application of molecular and biotechnological techniques: Polymerase chain reaction, Nucleic acid hybridization, DNA library, DNA sequencing, DNA fingerprinting, IPR, Ethics and regulatory issues in Animal Biotechnology.
Unit 4	Veterinary Immunology and Serology History of Immunology; Lymphoid organs, tissues and Cells: Types of Immunity; Antigens, hapten, epitope, Specificity, T dependent and T independent Antigens, heterophile Antigens, cross reacting Antigens, blood group Antigens, Mitogens and factors affecting immunogenicity; Adjuvants; Antibody: Structure, physiochemical properties and functions of various classes of immunoglobulins, Theories of antibody production; Hybridoma and monoclonal antibodies, Serological reactions. Major histocompatibility complex (MHC) structure, function and gene organization; Structure of BCR and TCR; Antigen processing and

	presentation; Complement system: activation pathways and biological consequences; Cytokines: general properties, major types and function; Hypersensitivity: classification and mechanism of induction; Autoimmunity; Immunotolerance; Concept of Immunity to Microbes, Vaccines and other biological.
Unit 5	General and Systematic Veterinary Virology History of Virology; Introduction to viruses; Structure of Viruses; Classification of Viruses; Viral Replication; Genetic and Non-genetic viral interactions; Virus-Cell Interactions; Viral Pathogenesis, Oncogenesis, latency and immunopathology. Studies on General Properties, Antigens, Cultivation, Pathogenesis, Epidemiology, Clinical Signs, Diagnosis, Prevention and Control of following Viruses and Prions Causing Diseases in Livestock and Poultry: <i>Birnaviridae</i> : Infectious bursal disease virus; <i>Reoviridae</i> : Rotaviruses, Bluetongue virus, African horse sickness virus; <i>Paramyxoviridae</i> : Newcastle disease virus, Canine distemper virus, PPR virus; <i>Rhabdoviridae</i> : Rabies virus, Ephemeral fever virus, <i>Bornaviridae</i> : Borna virus. <i>Orthomyxoviridae</i> : Swine, Equine, Avian Influenza Viruses. <i>Coronaviridae</i> : Infectious Bronchitis virus, Transmissible gastroenteritis virus; <i>Arteriviridae</i> : Equine viral arteritis virus, <i>Picornaviridae</i> : FMD virus, Duck viral hepatitis virus; <i>Caliciviridae</i> : Feline calici Virus, <i>Togaviridae</i> : Equine encephalomyelitis viruses; <i>Flaviviridae</i> : Swine fever virus, BVD virus; <i>Retroviridae</i> : Visna or maedi virus, Equine infectious anemia virus, Lymphoid leucosis virus, Bovine leukemia virus. <i>Poxviridae</i> : Capripoxvirus, Avipoxvirus, Cowpoxvirus; <i>Asfarviridae</i> : African Swine Fever Virus; <i>Herpesviridae</i> : Bovine herpes viruses, Equine Herpes viruses Infectious laryngotracheitis virus, Marek's disease virus, Pseudorabies virus, Malignant Catarrhal Fever virus; Duck Plague virus, <i>Adenoviridae</i> : Infectious Canine Hepatitis virus, Egg Drop Syndrome virus, Fowl adenovirus, <i>Papillomaviridae</i> : Papillomatosis, <i>Parvoviridae</i> : Canine parvoviruses, Feline panleucopenia virus; <i>Circoviridae</i> : Chicken Anemia Virus; Prions: Scrapie, Bovine Spongiform Encephalopathy; Emerging, re-emerging and transboundary viruses and Viral Infections.

Practical

Unit	Contents
Unit 1	General and Systematic Veterinary Bacteriology Orientation to bacteriology laboratory; Methods of sterilization and disinfection; Preparation of culture media for cultivation of aerobic and anaerobic bacteria; Methods of inoculation, Cultivation of aerobic and anaerobic bacteria; Isolation of bacteria in pure culture; Simple staining, Negative staining, Differential staining procedures of bacteria: Gram's staining, Acid fast staining; Special staining procedures: Capsule and Spore staining; Bacterial motility; Culture sensitivity test; Outlines of collection, transportation and processing of samples for bacterial disease diagnosis. Characterization of <i>Staphylococcus</i> ; <i>Streptococcus</i> ; <i>E. coli</i> <i>Salmonella</i> ; <i>Klebsiella</i> and <i>Proteus</i> ; <i>Pseudomonas</i> ; <i>Pasteurella</i> ; <i>Clostridium</i> ; Isolation and identification of bacteria from clinical cases of Mastitis, Abortions, Enteric, Respiratory and Pyogenic infections.
Unit 2	Veterinary Mycology Outline of collection, transportation and processing of samples for fungal disease diagnosis, Preparation of culture media, Cultivation and slide culture technique of fungi; Cultural characteristics of fungi; Lactophenol cotton blue staining to study morphology of fungi; Culture

	sensitivity test of fungi; Diagnosis of Aspergillosis and Candidiasis; Demonstration of other important yeast, moulds and Dermatophytes.
Unit 3	Animal Biotechnology Extraction and quantitation of nucleic acid; Plasmid isolation and plasmid profiling; Agarose gel electrophoresis for studying or diagnosis of nucleic acid of microbes; SDS PAGE electrophoresis for studying or diagnosis of proteins of microbes; Use of Multimedia and audio-visual aids for molecular biology aspects.
Unit 4	Veterinary Immunology and Serology Inoculations of lab animals, preparation of antigen, raising of antisera, separation and preservation of serum, Concentration of Immunoglobulins, Agglutination tests: Plate, Tube, Haemagglutination, Precipitation test: Agar gel precipitation Test, Single radial immunodiffusion test, Immunoelectrophoresis, Cell mediated immune response (DTH), Enzyme linked immunosorbent assay (ELISA), Visit and appraisal of Veterinary biological institute.
Unit 5	General and Systematic Veterinary Virology Orientation to a virology laboratory; Collection, preservation, transport of samples and their processing in virology laboratory; Isolation of viruses in laboratory animals or poultry or embryonated chicken eggs; Preparation of media and reagents for cell culture; Subculture and maintenance of continuous cell lines; Quantitation of cells by viable cell counts in a haemocytometer; Cryopreservation and recovery of cell cultures; Preparation of Primary cell culture (chicken embryo fibroblast or Lamb kidney); Demonstration of cytopathic effect by viruses in cell culture (Important virus isolates available in the department); Demonstration of Titration of virus by TCID50 and plaque assay in cell cultures; Demonstration of neutralizing antibodies by serum neutralization test in cell cultures; Agar gel precipitation test for detection of virus infection; Titration of Newcastle disease virus by haemagglutination test; Haemagglutination inhibition test for detection of antibodies to Newcastle disease virus; ELISA for detection of viral antigen and antibodies; Molecular techniques for viral disease diagnosis.

Syllabus Distribution for Annual Board Examination:

Examination	Papers	Units	Maximum marks	Weightage
Internal Assessment	First	30 % (Unit 1 and 2)	40	10
	Second	60 % (Unit 3 and 4)	40	10
	Third	90 % (Unit 5 and 6)	40	10
Annual Board	Theory			
	Paper-I	Unit 1,2 and 3	100	20
	Paper-II	Unit 4 and 5	100	20
	Practical			
	Paper-I	Unit 1,2 and 3	60	20
	Paper – II	Unit 4 and 5	60	20

PG Academics

Summary of PG students:

Sr. No.	Details	No. of Students passed out	No. of Students presently enrolled
1.	Master	-	-

2.	Doctorate	-	-
	Total	-	-

PG Courses

(To be started in upcoming year)

Sr. No.	Code	Course Title	Credits Hours
1.	VMC 501	General Bacteriology	2+1
2.	VMC 502	Systematic Veterinary Bacteriology	2+1
3.	VMC 503	General Virology	2+1
4.	VMC 504	Systematic Veterinary Virology	2+1
5.	VMC 505	Principles of Veterinary Immunology	2+1
6.	VMC 506	Veterinary Mycology	1+1
7.	VMC 507	Vaccinology	2+0
8.	VMC 508	Techniques in Microbiology	0+2
9.	VMC 509	Techniques in Molecular Microbiology	1+2
10.	VMC 510	Molecular Immunology	1+1
11.	VMC 511	Mucosal Immunology	1+0
12.	VMC 512	Introduction to Microbial Bio-informatics	1+0
13.	VMC 591	Master's Seminar	1+0
14.	VMC 599	Master's Research	0+20

Ph.D. Courses

Sr. No.	Code	Courses Title	Credits Hours
1.	VMC 601	Advances in Veterinary Bacteriology	2+1
2.	VMC 602	Advances in Veterinary Mycology	2+1
3.	VMC 603	Bacterial Genetics	2+0
4.	VMC 604	Microbial Toxins	2+1
5.	VMC 605	Bacterial Pathogenesis	2+0
6.	VMC 606	Advances in Veterinary Virology	2+1
7.	VMC 607	Molecular Viral Pathogenesis	2+1
8.	VMC 608	Structure Function Relationship of DNA and RNA Viruses	2+0
9.	VMC 609	Oncogenic Viruses	2+0
10.	VMC 610	Slow Viral Infections and Prions	1+0
11.	VMC 611	Advances in Veterinary Immunology	2+1
12.	VMC 612	Cytokines and Chemokines	2+0
13.	VMC 613	Immunoregulation	1+0
14.	VMC 614	Advances in Vaccinology	2+0

15.	VMC 615	Current Topics in Infection and Immunity	2+0
16.	VMC 616	Veterinary Microbial Biotechnology	2+1
17.	VMC 690	Special Problem	0+1
18.	VMC 691	Doctoral Seminar I	1+0
19.	VMC 692	Doctoral Seminar II	1+0
20.	VMC 699	Doctoral Research	0+75

PG Examination Patterns

Sr. No.	Examination	Theory	Practical
1.	Self-study (Assignment/Presentation)	20	-
2.	Internal test		
	First Test	10	-
	Mid Term Test	20	50
3.	Semester End Examination	50	50
	Total Marks	100	100

Research Areas of the Department

• Identification of important infectious diseases in animals of Kutch Region
• Detection of subclinical Mastitis in Bovine population of Kutch Region
• Rapid diagnosis of major Bovine and Canine diseases by lateral flow assay
• Detection of Brucellosis in animals of Kutch Region

Contact details

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