

Veterinary Preventive Medicine (VPM) Graduate Certificate “Roadmap” of Courses

Starting Fall term:

Semester	Course (select <i>one</i> option each semester)	
Fall, Year 1	VDPAM 527 Applied Statistical Methods in Population Studies (offered odd years) OR VDPAM 529 Epidemiological Methods in Population Research (offered even years)	
Spring, Year 2	STAT 587	Statistical Methods for Research Workers (Online w/Dr. Wang)
Fall, Year 2	VDPAM 527 Applied Statistical Methods in Population Studies (offered odd years) OR VDPAM 529 Epidemiological Methods in Population Research (offered even years)	
Spring, Year 3	VDPAM 528	Principles of Epidemiology and Population Health
Fall, Year 3*	Elective credit course: ISU Graduate-level course including: VDPAM 562 Applied Diagnostic Technologies (alt Fall, Even) VDPAM 650 Swine Diagnostic Medicine VDPAM 654 Comp. Antim. Clinical Pharmacology (Alt F, Odd) VDPAM 567X Design, Impl. and Analysis of Field Studies (Alt F, Odd)	

* Students may choose to skip this semester and enroll into a Spring course in Year 3 (see next table)

Starting Spring term:

Semester	Course (select <i>one</i> option each semester)	
Spring, Year 1	STAT 587	Statistical Methods for Research Workers (Online w/Dr. Wang)
Fall, Year 1	VDPAM 527 Applied Statistical Methods in Population Studies (offered odd years) OR VDPAM 529 Epidemiological Methods in Population Research (offered even years)	
Spring, Year 2	VDPAM 528	Principles of Epidemiology and Population Health
Fall, Year 2	VDPAM 527 Applied Statistical Methods in Population Studies (offered odd years) OR VDPAM 529 Epidemiological Methods in Population Research (offered even years)	
Spring, Year 3*	Elective credit course: ISU Graduate-level course including: VDPAM 560 Ecology of Infectious Diseases (offered odd years) VDPAM 564 Animal Welfare Science and Research (Alt Spring, even) STAT 451XW Applied Time Series	

* Students may choose to skip this semester and enroll into a Fall course in Year 3 (see previous table)

How to Register for Classes:

Taken from the Graduate College Handbook:

2.1 - Registration

All students who attend classes at ISU must register and pay assessed tuition and fees. The ISU Office of the Registrar's website at <http://www.registrar.iastate.edu/> is the official source of information about registration for all students at ISU. Specific dates for registration are listed:

- on the Registrar's Web page,
- on the University Calendar,
- in the Iowa State Daily, and
- on many department bulletin boards.

Registration for summer session should be completed during the spring at the same time as registration for fall semester. All students are encouraged to register for courses on the Web through AccessPlus. Detailed instructions are provided at <https://catalog.iastate.edu/registration/>

2.1.10 Reentry Registration

Reentering graduate students with active status do not need to complete a reentry application, but they should contact their major professor(s) to select courses and to obtain registration information. Students with inactive status must undergo a reinstatement process. Students enter inactive status when they have not been registered for four consecutive terms excluding summer.

VPM Certificate Core Courses: choose from a total 28 course credits:

STAT 587: Statistical Methods for Research Workers

Cr. 4. F.S.SS. Prereq: An applied statistics course at the undergraduate level, such as STAT 101, 104, 105, 201, or 226. Students without an equivalent course should contact the department.

A first course in statistics for graduate students from the applied sciences. Principles of data analysis and scientific inference, including estimation, hypothesis testing, and the construction of interval estimates. Statistical concepts and models, including group comparison, blocking, and linear regression. Different sections are designed for students in various disciplines, and additional methods covered may depend on the target audience. Topics covered may include basic experimental designs and analysis of variance for those designs, analysis of categorical data, logistic and log-linear regression, likelihood-based inference, and the use of simulation. Equivalent to STAT 401 in previous catalogs. May not be used for graduate credit in the Statistics MS and PhD degree programs. Credit in STAT 401 or STAT 587, but not both, may be applied toward graduation.

VDPAM 527: Applied Statistical Methods in Population Studies

Cr. 3. Alt. F., offered odd-numbered years. Prereq: STAT 587

ANOVA, Linear Regression, Model Selection, Mixed Models, ANCOVA, Repeated Measurement Analysis, MANOVA, Nonparametric Methods, Diagnostic Test Evaluation, ROC Curve Analysis, Generalized Linear Models, Logistic Regression, Survival Analysis, Cox Proportional Hazards Regression, Count Data Analyses. This course is available on campus and by distance.

VDPAM 528: Principles of Epidemiology and Population Health

(Dual-listed with VDPAM 428). (Cross-listed with V MPM). Cr. 3. S.

Epidemiology of disease in populations. Disease causality, observational study design and approaches to epidemiologic investigations. This course is available on campus and by distance.

VDPAM 529: Epidemiological Methods in Population Research

Cr. 3. Alt. F., offered even-numbered years. Prereq: STAT 587, VDPAM 528

Designing, conducting, analyzing and interpreting outcomes from field-based studies, including cross-sectional, case-control, cohort, and clinical trials with categorical outcomes. This course is available on campus and by distance.

VDPAM 560X. Ecology of Infectious Diseases.

Cr. 3. Alt. Spring., offered odd-numbered years.

Topics of applied ecology of infectious diseases. Specific objectives include: a) understanding dynamics of pathogen transmission within and between population; b) how to reduce risk of pathogen introduction in populations; c) how to early detect pathogens and classify herds according to disease status; d) how to quantify pathogen transmission and impact in animal populations; e) applying and measure the effect of interventions to manipulate disease transmission dynamics within and between populations. Develop skills to prevent, detect and/or significantly control/eliminate animal health issues from animal populations. Learn how to quantify health issues and estimate the value of interventions to influence and mitigate health problems.

VDPAM 562X. Applied Diagnostic Technologies and Medicine for Infectious Disease.

Cr. 3. Prereq: Enrolled in a graduate program. Introductory epidemiology and/or infectious disease course encouraged. Veterinary medicine background beneficial.

Veterinary diagnostics and diagnostic medicine for infectious diseases in animal populations, mostly livestock, and clinical applications. Specific objectives include: understanding diagnostic process; mechanics of laboratory diagnostic methods; test development and validation; optimizing diagnostic outcomes; and applying diagnostic data to disease investigation and/or intervention. Additionally, students are expected to present a diagnostic relevant subject and participate in case review and discussion. On-line and can be asynchronous from time to time.

VDPAM 564X. Animal Welfare Science and Research .

Cr. 3. S.

Animal welfare is increasingly a key component of societal decisions about animal use, sustainable development and human-animal relationships. Understanding animal welfare as a scientific discipline, with primary focus on veterinary, biomedical and animal science

disciplines. Explore fundamental and applied approaches to animal welfare science, including experimental design, data analysis and interpretation of results. Topics selected will reflect student interests, and may include animal welfare assessment and assurance, animal cognition, pain assessment and mitigation, and animal models used in biomedical research.

VDPAM 567X. Design, Implementation and Analysis of Field Studies in Food Animals.

Cr. 3. Prereq: STAT 587 or equivalent; VDPAM 527 or VDPAM 529 or equivalent.

Design of field trials to test hypotheses related to biological outcomes in food animal production. Topics include field trial designs and how-to implement these trials under field/commercial conditions; and how to calculate sample size given different type of outcomes and covers the proper statistical analyses, interpretation, and communication of the results. Invited speakers will share how they use field trials in their daily practice. Case studies.

STAT 451 XW Applied Time Series

Cr. 3. Methods for analyzing data collected over time; review of multiple regression analysis. Elementary forecasting methods: moving averages and exponential smoothing. Autoregressive-moving average (Box-Jenkins) models: identification, estimation, diagnostic checking, and forecasting. Transfer function models and intervention analysis. Introduction to multivariate time series methods.

VPM Certificate Elective Credits:

These can be any approved Iowa State University graduate level or dual listed course (List of courses found at <https://catalog.iastate.edu/azcourses/>) including, but not limited to, any remaining core courses. With the permission of the Director of Certificate Education, students may also take graduate level courses at another approved institution to fulfill the requirements of the certificate. Examples of online courses related to the VPM Certificate include:

AN S 537A: Topics in Animal Behavior, Welfare: Animal Behavior (online)

Cr. 3. Alt. S., offered odd-numbered years.

Prereq: permission of instructor; M.S. or Ph.D. student

Each semester, the students' focus is on different topics related to animal behavior, animal welfare and contemporary issues related to animal behavior and welfare. Each topic is separate and distinct, and students may enroll in multiple topics. This is an on-line course only. Each topic may be taken only one time for credit.

BCB 546: Computational Skills for Biological Data (online)

(Cross-listed with EEOB). Cr. 3. F.

Prereq: Graduate student status or permission of the instructor

Computational skills necessary for biologists working with big data sets. UNIX commands, scripting in R and Python, version control using Git and GitHub, and use of high performance computing clusters. Combination of lectures and computational exercises.

VPM Graduate Certificate Program Contacts:

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Congratulations, You've finished your VPM Graduate Certificate! Now what??

After completion of your VPM certificate here are some options that may interest you.

- Continue with our VDPAM Veterinary Preventive Medicine MSc (either creative component or thesis option) Degree
- Continue to Veterinary Medicine DVM program