Agriculture Animal Science IV (Veterinary Medicine) (2025)

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Introduction. 2

A **Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.** 2.A

B **The Agriculture Career Cluster concentrates on scientific advancement of agriscience, cultivation, processing, and distribution of agricultural products, employing advanced technologies and sustainable practices to optimize global food systems. This Cluster also supports other plant- and animal-based industries including regenerative agriculture, sustainable logging, and fisheries. This Cluster has meaningful connections with the Energy and Natural Resources Cluster, highlighting a symbiotic relationship that emphasizes stewardship and resilient communities.** 2.B

C **The Agriculture Science Career & Technical Education Program of Study begins with Agriculture Science I, a common foundations course covering plant and animal biology, soils, water, and sustainable food systems. From there, districts may offer one or both two-course pathways: Crop Science II–III, which prepares students for the BASF Plant Science certification while using drone and satellite imagery in labs that align with both the University of Maryland's PLSC 112 Introductory Crop Science and the University of Maryland Eastern Shore's PLSC 184 Introduction to Plant Science; and Animal Science II–III, which culminates in the Elanco Fundamentals of Animal Science credential and capstone projects that map to UMD's ANSC 101 Principles of Animal Science as well as UMES's ANPT 114 Introduction to Animal Science. The Animal Science pathway also lays the academic and clinical groundwork for an optional fourth- level Veterinary Medicine IV course, enabling students to pursue the Elanco Veterinary Medicine certification.** 2.C

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D **In Agriculture Animal Science VI (Veterinary Medicine): Students capture and annotate digital radiographs, maintain electronic medical records in practice-management software, and develop client-communication competencies through role-play and telehealth scenarios. A required externship or supervised in-school clinic rounds culminates in a documented skills log, capstone presentation, and a digital portfolio that positions graduates for immediate employment as veterinary assistants or seamless transition into collegiate veterinary technology and animal-science programs.** 2.D

E **Students will participate in at least two Career-Connected Education and Work-Based Learning experiences in this course, which might include informational interviews or job shadowing relevant to the program of study.** 2.E

F **Students are encouraged to participate in extended learning experiences through aligned Career and Technical Student Organizations (CTSOs). CTSOs are a cocurricular requirement in the Carl D. Perkins Act, and alignment to CTSO activities is an expectation for CTE programs in the state of Maryland.** 2.F

Knowledge and Skills. 3

A **The student demonstrates the necessary skills for career development, maintenance of employability, and successful completion of course outcomes. The student is expected to:** 3.A

1. Identify and demonstrate positive work behaviors that enhance employability and job advancement, such as regular attendance, promptness, proper attire, maintenance of a clean and safe work environment, and pride in work. 3.A.1
2. Demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, active listening, and a willingness to learn. 3.A.2
3. Employ effective reading, writing, and technical documentation skills. 3.A.3
4. Solve problems using critical thinking techniques and structured troubleshooting methodologies. 3.A.4
5. Demonstrate leadership skills and collaborate effectively as a team member. 3.A.5
6. Implement safety procedures, including proper handling of hardware and following cybersecurity guidelines. 3.A.6
7. Exhibit an understanding of legal and ethical responsibilities in the Agriculture science field, following data privacy laws and best practices for security. 3.A.7
8. Demonstrate time-management skills and the ability to prioritize tasks in a technical setting. 3.A.8

B **The student identifies various career pathways in the agriculture science field. The student is expected to:** 3.B

1. Develop a career plan that includes the necessary education, certifications, job skills, and experience for specific roles in veterinary science and veterinary medicine. 3.B.1
2. Create a professional resume and portfolio that reflect skills, projects, certifications, and recommendations. 3.B.2

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3 Demonstrate effective interview skills for roles in veterinary science and veterinary medicine. 3.B.3

C The student develops technology and digital literacy skills. The student is expected to: 3.C

1 Navigate veterinary practice-management software to schedule appointments, enter SOAP notes, and generate itemized estimates or invoices while maintaining accurate electronic medical records. 3.C.1

2 Capture, annotate, and store digital radiographs or ultrasound images in DICOM or cloud folders, applying secure file-naming conventions and data-privacy protocols. 3.C.2

3 Consult reputable online drug formularies and withdrawal-time databases; use built-in dosage calculators to verify medication amounts and document them in a digital treatment log. 3.C.3

4 Employ telemedicine or secure video-conferencing tools to relay patient data and images to supervising veterinarians, demonstrating awareness of client confidentiality and cybersecurity best practices. 3.C.4

5 Integrate point-of-care sensor apps, spreadsheet functions, and basic statistical tools to graph trends in vital signs, lab results, or herd-health metrics for evidence-based decision- making. 3.C.5

D The student integrates core academic skills into veterinary practices. The student is expected to: 3.D

1 Apply algebraic reasoning and proportional relationships to calculate medication dosages, fluid-rate adjustments, and solution dilutions for multiple species and life stages. 3.D.1

2 Design and carry out controlled investigations—such as comparing wound-healing treatments—by formulating hypotheses, collecting quantitative and qualitative data, and interpreting results with basic statistical tools (mean, range, t-test). 3.D.2

3 Read, interpret, and synthesize complex technical texts, including peer-reviewed articles, drug formularies, diagnostic lab reports, and state veterinary regulations, to support evidence-based clinical decisions. 3.D.3

4 Produce clear, organized clinical documents—SOAP notes, discharge instructions, and client-education handouts—using appropriate medical terminology, standard abbreviations, and citation formats. 3.D.4

5 Deliver effective oral and multimedia presentations that explain case studies or research findings to both professional and lay audiences, employing visual aids (charts, radiograph images, infographics) to enhance comprehension. 3.D.5

E The student demonstrates the necessary skills to maintain a safe, compliant veterinary environment. 3.E

1 Identify and correctly use PPE, sharps-disposal systems, and sterilization equipment (autoclave or cold sterilant) for routine clinic tasks. 3.E.1

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2 Summarize Maryland veterinary-practice regulations and explain the scope of duties allowed for veterinary assistants vs. technicians vs. DVMs. 3.E.2

3 Create a biosecurity and zoonosis-prevention checklist for companion, food, and lab-animal housing areas. 3.E.3

4 Perform a hazard walk-through, labeling OSHA physical, chemical, and biological hazards; recommend mitigation measures. 3.E.4

5 Document emergency procedures for fire, anesthesia spill, animal escape, aggressive patient, and data breach scenarios. 3.E.5

F The student demonstrates the necessary skills to apply integrative A&P knowledge to patient assessment. 3.F

1 Locate major skeletal landmarks, venipuncture sites, and injection triangles on canine, feline, bovine, and avian mannequins or live demonstrations. 3.F.1

2 Collect baseline TPR (temperature, pulse, respiration) data on at least two species; chart deviations and relate findings to potential disorders. 3.F.2

3 Explain basic organ-system pathophysiology for common clinical presentations (e.g., canine parvovirus, bovine mastitis, avian respiratory disease). 3.F.3

4 Describe developmental differences—neonate, juvenile, adult, geriatric—that affect drug dosages and nursing protocols. 3.F.4

G The student demonstrates the necessary skills to assist with routine veterinary diagnostics. 3.G

1 Prepare blood smears and fecal floats; identify erythrocytes, leukocytes, parasites, and note abnormal morphology. 3.G.1

2 Read and record results from SNAP® or similar rapid tests (heartworm, parvo, FeLV/FIV), explaining test principles and false-positive risks. 3.G.2

3 Position and restrain a canine or feline mannequin for lateral and ventrodorsal radiographs; practice safe radiation PPE protocols using a teaching X-ray simulator or digital demo software. 3.G.3

4 Calibrate and use a glucometer and refractometer; interpret values in the context of species-specific reference ranges. 3.G.4

5 Complete a mock laboratory request form and chain-of-custody log for an outside diagnostic lab. 3.G.5

H The student demonstrates the necessary skills to support veterinarians in basic medical and surgical care. 3.H

1 Calculate drug dosages from label directions; draw up simulated intramuscular, subcutaneous, and intravenous injections using oranges, silicon pads, or task trainers. 3.H.1

2 Perform aseptic scrub and gowning/gloving procedures for surgical prep; maintain a sterile field during a simulated spay or suture lab. 3.H.2

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3 Demonstrate common restraint methods (lateral, sternal, standing) for dogs, cats, rabbits, and small ruminants to facilitate safe treatment. 3.H.3

4 Assemble and troubleshoot anesthesia circuits; monitor simulated vital signs and adjust vaporizer settings in a computer-based simulator. 3.H.4

5 Explain post-operative care requirements (analgesia, nutrition, wound monitoring) and draft a discharge instruction sheet for owners. 3.H.5

I The student demonstrates the necessary skills to interact professionally with clients and maintain accurate medical records. 3.I

1 Role-play reception encounters, intake history taking, and client education conversations using clear, empathetic language. 3.I.1

2 Enter SOAP (Subjective, Objective, Assessment, Plan) notes into sample veterinary practice- management software or a cloud-based template. 3.I.2

3 Generate an estimate and invoice for preventive care vs. surgical procedures; explain line items to a mock client. 3.I.3

4 Discuss confidentiality, informed consent, and data-privacy rules (e.g., HIPAA-like expectations in vet medicine). 3.I.4

5 Compare inventory-control methods for pharmaceuticals, biologics, and consumables; calculate reorder points and cost of goods sold. 3.I.5

J The student demonstrates the necessary skills to synthesize veterinary knowledge through supervised practice and career preparation. 3.J

1 Complete a minimum of 40 in-school clinical-skill hours (simulation labs) plus 60 externship hours at a partner clinic, shelter, or research facility (adjustable based on district resources). 3.J.1

2 Maintain a skill log documenting restraint, laboratory, surgical-assist, and client-service tasks; obtain mentor sign-offs for each competency. 3.J.2

3 Prepare for and attempt the Elanco Veterinary Medicine certification exam (or practice exam if the credential is still in pilot). 3.J.3

4 Assemble a digital portfolio that includes certification results, externship evaluations, case study reflections, and a résumé tailored to veterinary assistant positions. 3.J.4

5 Outline post-secondary pathways—CVA/AVA, A.A.S. Vet Tech, B.S. Animal Science, D.V.M.— identifying prerequisite courses, tuition estimates, and scholarship options. 3.J.5