INTRODUCTION – EXECUTIVE SUMMARY

The University of Minnesota (UMN) College of Veterinary Medicine (CVM) is located on the St. Paul campus of the Twin Cities campus. The CVM was established in 1947 and first obtained full accreditation from the AVMA COE in 1957. The Higher Learning Commission of the North Central Association of Colleges and School accredits the UMN.

The University of Minnesota is governed by a Board of Regents. The president of the University serves as the chief executive officer of the University and is supported by an executive team.

The mission of the CVM is to improve the health of animals and people by: 1) discovering and disseminating new knowledge and skills, 2) educating current and future veterinarians and biomedical scientists, and 3) providing innovative veterinary services. The CVM is succeeding in all of its missions as reflected by benchmarks including total budget, total budget versus state support or return on investment, caseload per senior student, diagnostic case material per senior student, research expenditures, and DVM/MPH class size. All of these benchmarks place the UMN in the top five or six veterinary colleges in the nation. In addition, the College is a leader in how it selects and develops veterinary students and in use of pipeline programs for selection of food animal students and minority students. Through the use of public/private partnerships, the College has developed novel training programs for dairy and small ruminant students that provide excellent training in a cost-effective manner.

The College has a five-year strategic plan that was developed in 2008 for implementation beginning in 2009. The plan was approved by the senior vice president of health sciences and by the provost. The plan was developed to be consistent with the strategic plans of the University and Academic Health Center (AHC). Each year, the College develops a “compact” that describes yearly plans and activities. Again, the plan must be consistent with those of the University and AHC.

The College benchmarks both financial and nonfinancial metrics with data in the Association of American Veterinary Medical Colleges (AAVMC) Comparative Data Report and with other schools and colleges at the University. The Administrative Council of the College regularly reviews the strategic plan to track progress on specific goals and strategies. Each project within the goals and strategies has assigned CVM leaders who are responsible for completion. The CVM also uses a software program called iDashboard to track real-time benchmark data in education programs as well as in the hospital and diagnostic laboratory.

The CVM considers its strengths to be: 1) talented and dedicated faculty, 2) supportive and accomplished staff, 3) intelligent and engaged students, 4) contemporary teaching facilities, 5) productive relationships with the veterinary community and other collegiate stakeholders, 6) numerous public/private and public/public partnerships, and 7) abundant clinical and diagnostic materials for teaching and research.

The CVM considers its challenges to be: 1) insufficient state support, 2) high tuition and student debt, 3) aging research facilities and ruminant hospital, 4) collegiate debt due to use of University-backed loans to address collegiate facility needs, 5) low numbers of tenure-track faculty, and 6) lack of state support for facility upgrades.

Recommendations are the following:

- Explore options for reducing DVM tuition costs with UMN as a means to ease student debt load
- Continue to plan replacement or renovation of companion animal wellness facility, Veterinary Science research facilities, veterinary isolation facilities, and Large Animal Hospital; complete expansion of the Equine Center; and complete planned renovations of the pathology teaching area, mews in The Raptor Center (TRC), and the Large Animal Holding facility for ruminants
- Ensure appropriate educational technology, elearning, and classroom support to allow faculty and students to have timely access to contemporary learning methodology
- Continue to work toward revised job classes with multi-year contracts for clinical and contract faculty
- Complete implementation of new curriculum and continue outcomes assessment to refine that curriculum
- Continue to participate in MnDRIVE and other University initiatives that align with the strategic plan of the College and enhance teaching, service, and research
- Continue to invest in public/private and public/public partnerships to enhance teaching, service, and research
- Expand existing diversity initiatives including pipeline programs, VetCamp, and multicultural scholars programs
- Explore opportunities with UMN to insure new faculty recruitment is possible through incentive programs to promote retirements with aging faculty members
STANDARD 1 – ORGANIZATION

1.1 Provide a college mission statement for the undergraduate, DVM, or equivalent program.

The mission and values of the University of Minnesota College of Veterinary Medicine are the following:

Mission

Improving the health of animals and people through:
- Education of current and future veterinarians and biomedical scientists
- Discovery and dissemination of new knowledge and skills
- Provision of innovative veterinary services

Values
- Innovation. We will enhance animal and human health through novel approaches to discovery and dissemination of knowledge and skills.
- Learning. We will be a community of learners offering exceptional lifelong educational opportunities.
- Professionalism. We will maintain the highest standards of honesty, integrity, and mutual respect.
- Service. We will provide innovative and compassionate service that exceeds our customers’ expectations.
- Communication. We will facilitate open communication with all constituents to earn and sustain trust and understanding.
- Collaboration. We will develop and promote collaborative mission-related efforts.
- Diversity. We will have a diverse student body, faculty, and staff and will create a hospitable environment for all.

1.2 Identify the body that accredits the university and the current status of accreditation.

The University is accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools (NCA). Founded in 1895, NCA is one of six regional accrediting associations in the United States. The Higher Learning Commission of NCA is recognized by the United States Secretary of Education and the Council on Higher Education Accreditation.

1.3 Provide a flow chart indicating the position of the college of veterinary medicine in the university structure.

See Appendix 1-1 for a flow chart demonstrating position of the College within the University.

The University of Minnesota is governed by a Board of Regents whose 12 members are elected by the Minnesota Legislature. The president of the University, Dr. Eric Kaler, serves as the chief executive officer of the University and ex officio president of the Board of Regents. The president is supported by an executive team that includes one senior vice president and provost Dr. Karen Hanson, vice presidents, the general counsel, chancellors of the University’s four coordinate campuses, the director of athletics, and the president of the University of Minnesota Foundation (www1.umn.edu/prod/groups/ur/@pub/@ur/@assets/documents/content/ur_content_454996.pdf).

The College of Veterinary Medicine is one of six schools and colleges that comprise the Academic Health Center (AHC). Disciplines in the AHC include allied health, dentistry, medicine, nursing, pharmacy, public health, and veterinary medicine. Centers and programs in the AHC provide opportunities for interdisciplinary teaching and research in bioethics, cancer, genomics, infectious disease, drug design, food safety, and spirituality and healing.

The dean of the College reports to the provost with clinical oversight provided by the senior vice president for health sciences, who reports to the president of the University. The University is one of a few universities that combine an academic health center and a college of food, agriculture, and natural resources. This organizational structure provides the College a significant strategic advantage in its ability to train veterinary and graduate students, to recruit faculty, and to generate new knowledge that improves the health of both animals and people.
1.4 Provide a flow chart of the organizational design of the college.

See Appendix 1-2 for a flow chart demonstrating organizational design of the College and qualifications of collegiate officers.

The dean is a veterinarian, has a Master’s degree, and is board-certified by the American College of Veterinary Internal Medicine. The dean is responsible for all professional, ethical, and academic affairs of the College. The College consists of three academic departments (Veterinary Clinical Sciences (VCS), Veterinary Population Medicine (VPM), and Veterinary and Biomedical Sciences (VBS)), and four centers (Veterinary Medical Center (VMC), Veterinary Diagnostic Laboratory (VDL), The Raptor Center (TRC), and the Center for Animal Health and Food Safety (CAHFS)), which report directly to the dean. All center directors and one department chair are veterinarians, and five hold PhDs.

1.5 Describe the role of faculty, staff, and students in the governance of the college and list the major committees of the college, and their appointment authority.

The College operates using a constitution and a set of bylaws, with faculty, staff, and students elected or appointed to committees. See Appendix 1-3 for a list of collegiate committees.

Administrative Council is the primary advisory committee to the dean and is made of up of the associate deans, department chairs, center directors and collegiate human resources director, and the chief financial officer/chief operating officer. All other committees are formed on an annual basis with recommendations from chairs, self-nomination, or recommendations from the Faculty Council. Faculty Council is representative of the collegiate faculty. The dean meets regularly with the Faculty Council and attends their meetings as requested. The Faculty Council and Administrative Council meet quarterly and are invited to participate in discussion of topics of interest. Students are represented on many College committees and participate in their own governance structure. SCAVMA and Student Council are very active within the College.

1.6 If the college plans to change its current organization, provide a summary of those plans.

There are no planned significant changes in collegiate organizational structure.
STANDARD 2 – FINANCES

2.1 Complete Tables A and B for the past five years and analyze the trends for each category.

See Appendix 2-1 showing Tables A and B for past five-year expenditures and revenues. Revenues represent external appropriations, billings, gifts, and other revenue sources, rather than expenditures against those funding sources (as was reported in the 2007 self-study report).

Analysis of revenue and expenditure trends – Total expenditures for the College have increased from $93 million to $104 million during the past five years, representing an 11.1% increase. During the same time frame, revenues have increased from $92 million to $104 million, representing a 12.8% increase. The College has managed to grow funding sources during this time frame despite reductions in state appropriations, recessionary impacts on service unit revenues, and a more competitive federal grant environment.

Analysis of trends of direct and indirect expenditures – The College has been successful in controlling costs to maintain financial stability during difficult economic times. Non-sponsored expenditures have remained relatively flat with the exception of recent facility improvement investments. Some of the major changes in categories of direct and indirect expenditures (Table A) are as follows:

Instruction – A slight increase in faculty effort and instructional expenditures occurred over the five-year reporting period, but a reduction in educational facilities construction expenses and a change in UMN accounting practices created a reported reduction of 38% from 2009 to 2013. In fiscal year 2009 (FY09), there were large expenditures associated with the Dairy Education Center (DEC). Prior to 2012, most of the faculty salaries paid on non-sponsored funding were in an account with an Instructional function code. In FY09, that account represented 75% of the faculty non-sponsored salaries. In FY13, faculty salaries against Instructional accounts represent 32% of the faculty non-sponsored salaries. The non-instruction activities are now in accounts with research or service functions, resulting in an increase in costs in those other categories. Although it added complexity to the financial reporting structure of the College, the action to split the salaries into separate accounts was taken to provide better information for cost of mission analysis and to inform curriculum evaluation and other financial decision making. The change was made in the middle of FY12, so FY13 was the first year that represents the true cost of Instruction activities. Table A has been adjusted to reflect both the old reporting methodology for reporting consistency and the new methodology. Using the restated reporting methodology, the Instruction costs have increased by 1% over the past five years, reflecting compensation and benefit increases and a modest increase in faculty numbers, offset by indirect costs reductions for facilities construction.

Academic Support – Expenditures have increased 8% during the past five years due to improvements in collegiate infrastructure and increased compensation costs. Staffing increases have been made to support the increase in student numbers; provide more administrative focus on teaching, research, and service missions; and provide increased financial and advancement support to the College.

Student service – Expenditure growth has been 4% during the past five years. The growth is due to increases in Academic and Student Affairs (ASA) staffing to support the larger student enrollment and learning technologies, increased compensation costs, and increases in student-related activity expenses.

VMC/VDL – Direct expenditures for the VMC have decreased by 2% from FY09 to FY13. Reductions in faculty and staff positions were made in the 2008-2010 time frame to adjust for the economic recession and the reduction in state support. Those reductions were partially offset with modest increases in compensation and medical supply costs. Faculty salaries associated with clinical teaching and service are included in the VMC and VDL budgets. Direct expenditures for the VDL have increased by 11% during the same time frame. After a reduction in the 2008-2010 time frame due to the recession and reduced state support, there have been increased expenditures related to increased testing activities, compensation increases, and inflationary increases in
laboratory supplies and services.

Student aid – Expenditures have increased 99% over the past five years from endowments and current gift funding for student support due to an increased emphasis on student support in the College’s development initiatives.

Sponsored research/other sponsored activity – Expenditures for sponsored research have remained flat over the past five years. After a strong increase in sponsored research during 2009-2011, the level of grant funding has reduced due to ending of the Stimulus funds and a more competitive grant environment. Other sponsored activity has increased by 138%, driven by a large United States Agency for International Development-sponsored grant (RESPOND), which has been $6 to $8 million in expenditures/year. Other increases in this category reflect the shift in faculty salaries for departmental/cost share research activity, compensation increases, and increases in endowment funded research. The College has also provided additional funding to support faculty research in the Signature Program areas. Without the accounting practice change that occurred in FY12 for faculty salaries, the growth in other sponsored activity would have been 92% for the five-year time frame.

External and public service – Expenditures have been increased by 43% during the past five years, driven by the accounting practice change that occurred in FY12 for faculty salaries for service activity, compensation increases, and increased external sales activity. Without the accounting practice change, the growth would have been 11%.

Some of the major changes in sources of income (Table B) are as follows:

State appropriations – State Operations and Maintenance (O&M) and State Special funding have decreased by 9% from 2009 to 2013. Large decreases were made as a result of reduced state funding to the University. Increases have come from recurring and non-recurring funding for special initiatives through the compact process.

Tuition and fees – Revenues have increased by 36% from 2009 to 2013. DVM class sizes have increased from 92 to 102 students during the past five years, which accounts for 19% of the 36% growth. Tuition rates have increased an average of 6% per year during that time frame. Tuition from graduate programs has remained flat during the past five years as a result of increased tuition rates offset by reduced enrollment. Tuition from undergraduate programs has increased from enrollment and tuition rate increases.

Endowments and gifts – Revenue from endowments has fluctuated by year, but increased an overall 1% during the past five years due to investment performance and contributions, offset by a reduced distribution in 2013 for open endowed chair positions. Revenues from current gifts have decreased by 5%. Fluctuations during the time period have been driven by recession, new campaigns, and the availability of donor pledge payments to pay the Equine Center construction loan.

Sponsored program income and indirect cost recovery – Revenue has increased 37% during the past five years. Revenue steadily increased from 2009 to 2011, driven by the RESPOND project. Since 2011, revenue has decreased with the ending of federal stimulus grants and several large federal grants. The largest growth has been in the Other Federal category, with a 131% increase. Private funded research has grown 11%. National Institutes of Health (NIH) expenditures have grown an overall 2% but United States Department of Agriculture (USDA) expenditures have decreased 68% during the past five years. Indirect cost recovery funds (ICR) have grown from $2.7 million to $3.6 million during this time, peaking at $4 million in FY11.

VMC/VDL – VMC clinical revenues have fluctuated during the past five years, with an overall reduction of 1% as a result of impacts of the recession and increased competition for specialty services. Modest price increases have occurred during this time frame, but have not resulted in significant increases in revenue. VDL revenues have also fluctuated with the recession, but have increased an overall 10%, with price increases, new testing capabilities, faculty, and staff.
Other sales and services – Revenues have increased 55% during the past five years. The major areas of growth have come from increased faculty external sales activities, Continuing Education, and Caribbean student rotation income.

2.2 Comment on the strengths and weaknesses in revenues over the past five years.

Chart C (Appendix 2-2) displays the trend in non-sponsored revenues and expenditures for the past five years. As a result of state budget deficit issues, state funding to the College has decreased by 9% and the percentage of total O&M and State Special appropriations funding has become a smaller portion of the overall collegiate budget, decreasing from 25% of the budget to less than 20% during the past five years. The College perceives itself as under-funded in comparison with other colleges of veterinary medicine. The University ranks 16th of all 28 colleges of veterinary medicine in state appropriations per DVM student based on the 2012-2013 AAVMC data. Minnesota was also ranked 23rd of 28 schools on the percentage of faculty paid with state-appropriated funding.

As a result of the decreased state appropriation funds, recruitment of tenure-track faculty positions was limited during the 2009-2013 time period and faculty growth came primarily through contract positions. Additional tenure-track positions have been hired in fiscal 2014 with other searches underway.

A major strategy of the College has been to increase revenues from other sources in order to reduce dependence on state appropriations. Tuition has increased significantly from 2009 to 2013. The College increased the number of students in the DVM program to increase the number of food animal and public health veterinarians, which also increased the tuition revenue. The College has also increased the number of Caribbean school student rotations to bring in additional revenues. Reductions in the graduate program enrollment have offset the DVM tuition increases. New undergraduate student courses have been offered to students from other schools within the University to increase the amount of funding to the College. Tuition rate increases for DVM and graduate school students have been substantial over the past five years. DVM tuition has increased by an average of 6% per year for residents and non-residents during the past five years. As a result, College tuition ranked fourth-highest for residents and second-highest for non-residents based on the 2013-2014 AAVMC data (based on 4 year tuition and fees) and College students ranked second-highest in median educational debt. The College is concerned about the high cost of tuition and student indebtedness and the potential impact it has on the recruitment of applicants to Minnesota and the success of students after graduation.

In 2014, the College reduced the amount of tuition charged for the third clinical semester by 25% for residents and non-residents. The impact of that change was estimated as $439 thousand in reduced tuition revenues for the College.

VMC and VDL revenues have fluctuated significantly during the past five years. Both service units experienced reduced caseload during the recession. The VMC is also faced with increasing competition from area emergency and specialty care veterinary practices. Price increases have resulted in reduced transaction costs in many areas as clients have chosen lower-priced procedures. The VDL caseload has recovered more quickly than that of the VMC. The VDL has seen growth in testing for emerging diseases such as porcine epidemic diarrhea virus (PEDV). With compensation and medical supplies and services cost increases, caseload is closely monitored in the service units and new investments are carefully evaluated. The VMC has funded improvements in facilities, equipment, and staff over the past eight years through internal loans. The VMC has had difficulty meeting the debt service for the past several years. The College has made several loan prepayments to reduce the amount of annual payments and has provided the VMC interest-free loans to cover deficits from FY10-13. VMC caseload has increased from budget assumptions in the current year and performance is expected to exceed the plan. The VDL had represented significant risk to the College, but efforts with external stakeholders and the University resulted in increased funding totaling $2.5 million between 2008 and 2013 to support the VDL’s disease surveillance activities and restore the unit to financial stability.

Although sponsored revenue has grown over the past five years, the College is implementing strategies to increase NIH funding and to obtain grants with higher salary savings and indirect cost rates to improve our financial stability. There is rising cost pressure from laboratory renovation expenses and new-hire startup
packages that require increased financial benefit from our research grants. New facilities for microbial science research and BSL2/3 animal biocontainment that are part of the University’s six-year capital plan will support the pursuit of new grant funding opportunities. Several new faculty hires have sponsored funding and are generating ICRs and salary savings for the College.

Revenues from gifts and endowments for current use have not kept pace with the rest of the collegiate funding, although planned giving has increased from $27 million to $34 million during the five years and the value of endowments has increased from $16 million to $24 million. Funding for scholarships and fellowships has increased, providing some student relief from rising tuition and fees. Other areas of successful fundraising include TRC animal housing campaign (funds not yet withdrawn) and VMC endowment for clients without funds to pay for treatment. Fundraising for research, VMC programs, and facilities has not yet seen significant results. Recruiting top researchers has been difficult without endowments and current gifts to fund salary and equipment. Development staff has been increased to focus on major campaign priorities.

2.3 Provide a comprehensive trend analysis of revenue sources that have supported the professional teaching program over the past five years.

Chart D (Appendix 2-3) shows expenditures for the DVM program (including the categories of instruction, student services, sponsored student aid, and the VMC). These have increased from $34 million to $35 million during the past five years (normalizing for faculty salary account changes as described in section 2.1.). While the amounts have increased, there has been a noticeable shift between funding sources. The percentage funded by tuition and state appropriation has grown from 47% to 50% of total expenditures, clinical income has decreased from 46% to 42%, and other revenue sources have ranged from 3% to 4%, with a spike in FY10 from one-time stimulus funding from the state. Revenue from endowments and current gifts has remained at 3% during the five-year time period.

2.4 Describe how revenues over the past five years have impacted the college’s ability to provide a contemporary professional teaching program and ancillary support services.

The College has used the revenue growth to make improvements in the professional teaching program. Significant investments have been made in classrooms, library, teaching laboratories, student study areas, and building security to improve the technology, comfort, and safety for students. Staff resources were increased in ASA. The number of faculty has increased from 143 in 2009 to 150 in 2013. The reduction of state appropriations has had a major impact on the College. As a result, the College has had to respond by increasing tuition rates and class size, and changing the mix between resident/non-resident students from 60/40% to approximately 55/45% to offset the state funding loss.

2.5 Compare the percentage of hospital income to total hospital operational costs.

The VMC is funded by tuition/state O&M, clinical income, philanthropic gifts, and revenues from Caribbean student rotations. Chart E (Appendix 2-4) illustrates the relationship between VMC expenditures and VMC income, excluding the tuition/state funding. As is shown in the chart, clinical income alone is not sufficient to cover VMC expenditures. The percentage of expenditures covered by VMC-generated income has reduced from 78% to 77% from 2009 to 2013. Tuition/state funding has increased during that time frame, covering increases in faculty compensation and VMC operating costs. The VMC has high debt service costs associated with an internal loan used to fund previous initiatives in facilities, equipment, people, and processes. The debt service has been difficult for the VMC to manage, and the College has made prepayments against the loan to reduce the amount of annual debt service. With the recessionary impacts on VMC caseload and revenues, the VMC has experienced annual deficits since 2010 totaling $2.8 million. The VMC is currently focused on marketing services in key areas to increase caseload. Moderate price increases have been implemented to increase revenues. The VMC has also been implementing process improvements and technology enhancements to increase productivity and reduce costs. It is expected that the VMC will be able to return to financial stability as a result of these actions.
2.6 Described anticipated trends in future revenues and expenditures.

The College expects to see continued increases in VMC and VDL revenues, with increasing caseload and modest price increases. Tuition funding will continue to grow at a slower rate than has been experienced in the past to address student debt issues. Faculty are developing new undergraduate courses to generate additional revenue and are evaluating opportunities for on-line courses. State O&M and State Special appropriations are expected to stay flat or decline. Despite challenges in the federal funding environment, research revenue is projected to increase as a result of new faculty hires and investment in initiatives including seed grant funding, new collaborations and areas for research funding, and actions to increase proposal success. The Clinical Investigation Center is projected to continue to increase funded clinical trials and continue to improve its competitiveness for comparative medicine grant funding. More emphasis is being put on resource development, so endowment and gifts are expected to increase.

Collegiate expenses will continue to face upward cost pressure. The College continues to recruit new faculty and staff to support all areas of the mission. Salary increase rates are expected to rise from the previous five years and the cost of medical benefits is expected to outpace general inflation. The cost of teaching animals continues to rise. The College is heavily leveraged with internal loans for the Equine Center ($11 million remaining over 15 years) and VMC investments ($4 million remaining over eight years). The College has plans for significant renovations in TRC, research laboratories, the Equine Center, and the VMC in the next five years, in addition to investments in the Microbial Sciences Research Building and BSL2/3 animal bio-containment facilities. The College will continue to evaluate its cost of mission and look for opportunities for productivity improvements and cost reduction to offset the rising expenses.

The University has continued to use the financial model for distributing revenue and central overhead to the colleges since its implementation in 2007. The University transfers all generated revenues to the colleges, including ICRs and student fees, and distributes overhead expenses and facilities costs to the colleges. While the University overheads have continued to increase, the College believes it is better off under this model. Future revenue growth will not automatically be assessed with additional overhead expenses as under the previous model, so there are opportunities for financial improvements if revenue growth exceeds the growth in University central services expenses.
STANDARD 3 – PHYSICAL FACILITIES AND EQUIPMENT

3.1 Provide a brief description of the major functions of, or activities that take place in the facilities used by the college in fulfilling its mission.

The College’s facilities are located on the University of Minnesota’s St. Paul Campus. Four connected buildings and five support structures are in close proximity on campus. Five associated facilities for large animal teaching and research and one small animal teaching facility are off-campus.

Major Buildings

Constructed in 1976, the Animal Science/Veterinary Medicine (AS/VM) building is a four-story, 127,006 assigned square feet (ASF) structure, of which 49,913 square feet are assigned to the College and which houses departmental offices, conference rooms, and research space for all three departments. The building also houses two of the three major classrooms and the Active Learning Classroom/histology laboratory used for the DVM curriculum; the anatomy teaching laboratory; and a lounge and mailboxes for the first-year class. This building is also home to the Minnesota Veterinary Historical Museum.

The Veterinary Science (VS) building is a four-story, 82,412 ASF structure constructed in stages between 1940 and 1960, with extensive remodeling in 1981. The building houses the VBS departmental office, conference rooms, and research laboratories for clinical pathology, microbiology, parasitology, and avian medicine. This building houses a backup/smaller use classroom (145) used for the DVM curriculum, as well as two teaching laboratories used for clinical and gross pathology, microbiology, and parasitology. The Veterinary Medical Library, Computer/Audiovisual Laboratory, and research animal housing facilities are located in the building.

The VMC building is a four-story, 213,965 ASF structure constructed in stages between 1940 and 1980. The original structure served as the small- and large-animal veterinary medical center until 1982, when VMC functions were largely moved into the new VMC building. The VMC complex houses eight major functions: 1) the Small Animal Hospital, 2) the Large Animal Hospital, 3) the VCS department, 4) the VPM department, 5) CVM administration, 6) office space for residents and interns, 7) Surgery and Clinical Skills teaching laboratory, and 8) research laboratories of VCS and VPM faculty. Ancillary functions such as a student lounge, Veterinary Student Services (the student bookstore), the SCAVMA college feeding program, and nursing mother’s room also are in this building.

The VDL building is a three-story, 58,793 ASF building originally constructed in 1961, with major additions in 1992 and 2004. The building houses the VDL, the VPM offices, research laboratories, and several service laboratories for the VCS department. The building also contains a 760 square-foot alkaline hydrolysis digester.

Supporting Structures

The Ben Pomeroy Student-Alumni Learning Center is a 9,000 ASF building that was renovated in 2007 and serves as an educational center for students, alumni, and practicing veterinarians. The facility includes the third large classroom (215), a classroom for 50 students, two seminar rooms, student lounge, commons areas, cafeteria, and ASA offices.

The Equine Center was completed in 2007 on the northeast corner of the St. Paul Campus. The $13.9 million, 60,000 square-foot facility is used for clinical teaching, clinical service, laboratory instructional programs, and research. The facility includes an area for lameness evaluation, including a high-speed treadmill and force plate; aqua treadmill; surgical suite; laboratory; and clinical space for a sports medicine program, reproductive medicine, and teaching. It also includes an indoor arena, conference center, and an additional barn facility. The Equine Center houses the teaching horse herd as well as a resource herd used for undergraduate teaching and outreach activities.
Large Animal Holding is a 21,330 ASF structure, constructed primarily in 1973, with an addition in 1998. The original structure provides space for laboratory instructional programs in surgery, large animal medicine, theriogenology, large animal clinical skills, and to a lesser degree, for anesthesiology, anatomy, physiology, and pharmacology. Teaching animals (food and fiber) are housed here; the equine teaching herd has been moved to the Equine Center and the only equine animals now housed here are short-term ponies (housed for less than a week) for the elective junior surgery laboratory. When available, animal space in one portion of the facility is contracted out to intramural and extramural research programs. These facilities are managed by the University Research Animal Resources (RAR).

Three BSL2 isolation research units provide a total of 12,542 ASF and are in continuous use by faculty engaged in large animal and poultry research. Units A and B provide the best BL2 isolation facilities. These facilities are managed by RAR. The facilities were constructed in the 1950s and a replacement to include BSL2/3 animal containment housing and procedure space is included in the University six-year plan.

The Raptor Center (TRC) is a 17,749 ASF structure built in 1987. This facility provides space for treatment and rehabilitation of raptors, public education, and staff offices. TRC facilities are used for elective laboratories and rotations.

Associated Facilities

Dairy Education Center (DEC). The College has invested $2.2 million of donor and University funding to construct an on-farm educational facility through a collaboration with a private dairy. The facility includes teaching, research, and dormitory space for students and faculty. The DEC is located in New Sweden Township, 80 miles from campus.

West Metro Equine Practice (WMEP). The College leases 900 square feet of office space in Maple Plain, Minnesota, located 28 miles from campus. There are two veterinary trucks available for the veterinarians, staff, and students on the Equine Ambulatory rotation to serve patients at barn facilities in the practice area.

R&D Systems Farm. The College has a contractual relationship with a farm in Cannon Falls, Minnesota. The farm maintains a breeding herd of 600 sheep/goats and is located 50 miles from campus. The 32,000 square-foot facility and herd are used for hands-on learning of reproductive techniques through field trips, labs, and rotations.

Transition Management Facility. The College maintains a collaboration with a dairy farm in Baldwin, Wisconsin. The program is devoted to applied research in dairy production and veterinary medicine.

St. Paul Dairy is located on the campus, one mile from the VMC. This 150-cow dairy provides an on-going caseload for the VMC and is used by the theriogenology program.

Animal Humane Society (AHS). The College recently entered into a collaborative agreement with the Golden Valley site, located 12 miles from campus. The College has invested $0.4 million in the construction and equipping of a 322 ASF surgical and support facility in the AHS site.

3.2 Provide an area map that indicates the principal facilities of the college and describe distance and travel time to off-campus facilities.

See Appendix 3-1 for maps of principal facilities including distance and travel time to off-campus facilities.

3.3 Describe the college’s safety plan and facilities management plan including mechanisms of documenting compliance.

Appendix 3-2 describes the improvements made to College facilities over the past five years. The College has invested over $9 million in improvements to research, teaching, and service facilities since 2009.
The University’s Department of Environmental Health and Safety (DEHS) maintains a University-wide health and safety program. DEHS has expertise in all areas of potential hazards and provides information, advice, and assistance to maintain adequate safety measures. The College’s health and safety committee partners with University resources to conduct employee training and instructional programs and sponsor facility-wide chemical cleanup activities. Departmental research safety officers (RSOs) conduct periodic inspections of research laboratories to determine compliance with safety and health standards and regulations. Principal investigators and laboratory managers are responsible for safety procedures in their laboratories. Chemical and biological hazard disposals follow University protocols, and routine certifications are conducted of biological safety cabinets and chemical exhaust hoods. Building emergency plans are being developed for all facilities.

Formaldehyde monitoring in the anatomy laboratory is supervised by anatomy faculty working with DEHS. Monitoring was performed in 2009 for four consecutive months, during which small animal and large animal dissections were performed. Levels were recorded throughout that time on student and faculty monitoring badges, and during times most likely to be associated with release of formaldehyde (for example, when opening body cavities). All results were acceptable, and the College was informed by DEHS that we did not need to monitor again unless we changed the embalming fluid(s) we were using. There have been no changes in embalming fluids since that time.

Radiation safety in the Diagnostic Imaging unit is modeled for the students in several ways. Faculty and staff that are involved in radiography, fluoroscopy, and nuclear medicine are monitored via dosimetry badges. Students have historically used dosimetry badges as well, but in spring of 2014 will be switched to use of instadose badges. These badges are programmed specifically for the student and are available for students when they are on the radiology, large animal medicine, large animal surgery, equine lameness and podiatry, or small animal surgery rotations, which are those rotations where students perform diagnostic radiography. At the end of the rotation, the student hands in the badge and information is downloaded with a report mailed to the student and supervisors. Leslie Hiber is the infection control and radiation safety officer for the College.

The dispersed entry points to the complex present security challenges. The College has invested over $0.2 million (with matching funds from the University) since 2011 to improve security of the facilities. Each major building entrance is equipped with a card-swipe reader, and outdoor security has been improved through the installation of more lighting, security cameras, and use of University escort services. The College now has the ability to electronically lock down all external doors to its buildings through the University Central Security Office.

Building code deficiencies, including automatic sprinkler protection, emergency lighting, and enunciator systems, also represent facility safety issues and are being addressed as renovation projects are completed. Fire suppression infrastructure and fire detection systems have been installed in the VMC North and South facilities. Renovation plans for the VMC will require upgrades of safety systems, including automatic sprinkler protection to specific areas.

3.4 Describe the adequacy of all facilities used by the college.

Classroom facilities are considered adequate. Four classrooms are large enough to accommodate a full class (102 students), and are centrally scheduled. The majority of lectures and large class activities in the first three years of the DVM program are taught in these rooms. Each student class is based in the room closest in proximity to that class’s mailboxes, lounge, and lockers. Most large group rounds and seminars are scheduled in AS/VM, which has high-quality lecture rooms with excellent audiovisual support services, including lecture capture equipment. The classrooms have been renovated in the past five years to accommodate larger class sizes, and with upgraded technology and furnishings. The four lecture rooms are supported by University Classroom Services and equipment for these rooms is considered adequate. The classrooms include full presentation capabilities and power outlets for student computers. All four large classrooms have mounted video projectors, computer projection capabilities, and computers. Three of the large classrooms are wired for power at each student seat and all have wireless Internet access. Lecture capture equipment was installed in 2010 in the two classrooms in
AS/VM and larger classroom in Pomeroy. The Pomeroy Student-Alumni Learning Center’s expanded classroom facility seats 145 students.

Heating and ventilation systems were upgraded in the three main classrooms, and the installation of environmental monitoring equipment facilitates faster response when temperature fluctuations occur. Wireless upgrades were made to provide more capacity in the classrooms, and the University Information Technology staff meets with students at the beginning of each year to evaluate their computers to optimize computer interface with classroom systems. The Vet Science 145 classroom is not optimal space, given its long, narrow shape, and is now only used as a backup classroom or for smaller group courses.

The College does not have a large auditorium that would facilitate lectures or events for more than one class or a combination of faculty and students. The College has increased the number of seminar rooms for small group work, elective courses, and senior rotations and gained two more with renovation of the Pomeroy Center. A 383 square-foot room was renovated in 2011-2012 with teleconference equipment, a larger display monitor for presentations, and new furnishings. A 690 square-foot room was renovated in 2013, with flexible seating arrangements and technology connections. Upgraded rounds rooms are available for surgery and internal medicine in the VMC. Seminar room space, which is also used for departmental and administrative functions, is often inadequate for current curricular and service functions.

The Active Learning Classroom in AS/VM 104 has inputs for various computer devices located at each table, monitors at each table and mounted around the room, and technology that allows selected students to display their computer outputs to all monitors in the room. All faculty have access to computers in their offices and are connected to the Internet with some wireless capability. There are 19 servers, located in three different places across the Twin Cities campus, to support collegiate teaching and research functions. Computer support is managed by central Information System (IS) help desk professionals. The College provides computers for student use in the computer laboratory. VMC internal cell phone capabilities were upgraded in 2013 to improve communication within the facilities.

There are good facilities for laboratory instruction in both the preclinical and clinical sciences, with 29,560 ASF of general and specialized instructional laboratories. The support and storage areas for these teaching laboratories are also adequate. The renovation of the AS/VM 104 classroom/microanatomy teaching lab provides space for 119 students at seventeen pod-shaped tables. Capacity in the renovated Surgery and Clinical Skills laboratory was increased to accommodate the larger class size, and special operating tables were purchased to accommodate larger animals used in the labs. The Computer/Audiovisual Laboratory was upgraded in 2010 and is now equipped with two ceiling-mounted projectors and two whiteboards. Twelve double-headed microscopes are housed in the adjacent cabinets for the fourth-year pathology rotations.

The VMC’s facilities and equipment are generally adequate, although the growth in caseload to 35,000 cases has put a strain on facilities that were originally designed for 18,000 cases per year. With the growth of small animal caseload, there is need for additional examination and conference rooms, service areas, and faculty office space. Plans have been developed to renovate the small animal lobby and administrative area to create an expanded General Practice service and teaching space, to promote service and teaching in preventive health care. Teaching space and special holding rooms are adequate. The facility is short of general space in the kitchen, housekeeping, clothing changes, and storage areas.

The current diagnostic imaging facilities and clinical laboratories, including clinical chemistry, hematology, surgical pathology/immunology, virology, toxicology, parasitology, and endocrinology, are adequate. A renovation to the clinical pathology laboratory was completed in 2008. The Oncology service area was renovated in 2010 and the Pharmacy area was upgraded in 2011. Spaces in the underutilized Large Animal Hospital were converted to an advanced imaging center in 2007 and 2011, with the installation of a state-of-the-art 3T MRI and CT scanner. The VDL facilities are good to excellent in terms of space and equipment.
The VMC large animal isolation unit can accommodate eight large animals, four designated for bovine and four for equine patients. The design and number of units has been adequate for the isolation of clinical cases. The small animal isolation unit contains five isolation cages; a closed-circuit camera to permit observation in the hospital intensive care unit of animals housed in the isolation facility will be installed in spring 2014.

Necropsy services are provided in the VDL. Space includes one walk-in cooler, three dock spaces, 10 tables plus one hydraulic lift table, and an overhead monorail system. Space is adequate for BSL2 necropsy activity. The College has constructed a BSL3 facility for high-pathogen necropsy activity. Access to the VDL is keycard controlled.

Clinical equipment is generally adequate for teaching. However, the College and its faculty desire to be a state-of-the-art resource for the veterinary profession. Existing equipment is becoming outdated and replacement costs are high. Most equipment is repaired, or parts are replaced. The VMC spends approximately $200,000 each year to purchase new or replacement equipment and $200,000 for facility-related projects that are funded from VMC income and gifts. The College took out an $11 million loan from the University to reinvest in VMC equipment and facilities as described in Standard 2. In addition to major equipment purchases, the VMC has been replacing computers for student and staff access to patient medical records.

The VDL currently applies user fees for the purchase of new equipment, as the state does not provide any special funds for this purpose. The VDL has been able to regularly reinvest in new equipment. The VDL uses proprietary diagnostic information software to provide Web-based access to data to its clients and continues to fund further enhancements to the system.

College animal facilities are run in accordance with all Animal Welfare Act and Public Health Service regulations. All University research animal holding facilities are AAALAC-accredited and inspected yearly by the USDA. All animal activities are approved by the University Institutional Animal Use and Care Committee, which conducts biannual inspections of all University animal facilities and reviews all animal use protocols. Animal care and oversight is provided by RAR, an independent University service organization charged with the responsibilities of animal husbandry and compliance with regulatory guidelines at the University. Several animal housing facilities were upgraded in 2010 at a cost of $0.3 million.

Large-animal research isolation facilities, considered barely adequate for research, limit the type of research that can be conducted by College faculty. Ventilation and temperature control is inadequate for controlled research studies. Plans to replace the isolation facilities are included in the University’s six-year capital plan. Short-term plans are being made to upgrade the HVAC system in one of the buildings so that it can be used during the warmer summer months prior to new facilities being constructed. The facility cannot handle solid wastes, so use of bedding materials is prohibited and hay feed is limited. While the anteroom space is good, the work areas are crowded and lack convenient sinks and other equipment. Adult horses and cows must be kept in the larger stalls located in the VMC facilities. The CVM does not have suitable facilities to conduct small animal (dog and cat) infectious disease research. Non-infectious disease research animal space is available in the teaching barn and the Equine Center.

Large animals for teaching are housed in the Large Animal Holding facility, which has adequate ventilation and temperature control for agricultural animal housing. There are enough spaces to house the animals, although stanchion stalls for cattle are not adequate for teaching or research purposes. The restraint systems are not considered adequate, as cows must be held in their stanchions during clinical skills teaching. The College changed to a smaller breed (Jersey) for better housing and management of the teaching cows. In addition, junior surgery laboratories with horses must be conducted in the box stalls rather than operating rooms. The paddock and turnout areas are not sufficient when larger numbers of animals are housed in the facility. The goat barn is considered an excellent housing facility for animals. The teaching horses have been moved to the Equine Center and have good paddock and turnout areas.
Research facilities for rodents are considered adequate, although not plentiful, with one BSL2 room and another room containing isolators. Facilities for maintenance of dogs and cats are spread among several rooms and are not conducive to larger studies that need a controlled environment. Space to accommodate both small animal teaching and research can be problematic during peak periods, but is managed through careful scheduling.

The College has research facilities located in all four buildings in the collegiate complex. The total research space in the College is 43,643 ASF, which includes 120 laboratories. There are 139 support rooms with a total of 12,467 ASF and 65 research offices with a total of 9,480 ASF. The total research laboratory and support space is 65,590 ASF.

With new research faculty hiring, the College is short of research space, and much of the space is outmoded and not configured well to support larger programs or collaborations. A recent analysis of the research space indicated that 18% of the research space is in good condition, 72% in fair condition, and 10% is in poor condition. Planning is underway for a new Microbial Sciences Research Building on the St. Paul campus and for new BSL2/3 research facilities as previously described.

College administrative offices are located on the fourth floor of the VMC and in the Ben Pomeroy Student-Alumni Learning Center, with the IS offices located in the VS building. The space is adequate for the administrative functions of the College, although the facility does not provide a good main entrance to the College, and the current location’s proximity to the small animal clinic would be better suited for a translational research facility.

The College is facing a serious shortage in faculty office space, especially in the VCS Department. The available office space in the vicinity of the Small Animal Hospital currently is filled to capacity. New faculty members are being doubled up in offices, housed in poor-quality office space, or housed in office locations away from their primary work areas. The College’s Space Committee reviews the office management plan during its monthly meeting.

Interns and residents have dedicated space within large shared offices. Graduate students are generally housed together in office space or cubicles in larger rooms. Several upgrades to cubicle areas have been made in the past five years. Unused office/lab space was converted to a Graduate Student Commons area.

Locker rooms and lounges are adequate and located in close proximity to student learning activities. Student locker rooms have been renovated with new lockers, floor surfaces, lighting, and restroom fixtures. Lounges have been renovated with new floor surfaces and furniture. With the renovation of the 104 AS/VM spaces into the Active Learning Classroom, first-year students lost their assigned study carrel space, and the College is adding additional lockers/storage space and AS/VM atrium study spaces to accommodate student needs. AS/VM 104 classroom will become available to students after-hours after the installation of security cameras is completed. Student commons areas with vending machines are located in VS and several areas in the VMC buildings. The Pomeroy Center includes a student lounge, commons area, and small food service area.

Air handling continues to be a challenge for the College, particularly in the two VMC buildings. HVAC systems were installed at different points as the buildings were added on to over the years, and are not well-integrated. An updated 2011 HVAC study recommended replacement of the HVAC system in the VMC. That approach is cost-prohibitive, and the College is addressing the air-balancing needs on an isolated basis with changing thermostats and fan speeds. Other College buildings generally have good air handling. As laboratory or service areas are renovated, improvements in air handling components are made. New chilled water plants were added to the St. Paul campus in 2005 and 2010, and most College buildings have been connected to the new system. The new system provides more constant temperatures during the cooling season and is more reliable and economical.
3.5 For safety and educational purposes, protocols must be posted in the isolation facilities and the facilities must be used for instruction in isolation procedures (biocontainment).

Posted protocols are located at each high-risk area as defined by DEHS. Principal investigators and laboratory managers are responsible for safety procedures in their laboratories. Departmental RSOs partner with DEHS personnel to conduct periodic inspections of research laboratories to determine compliance with safety and health standards and regulations. Chemical and biological hazard disposals follow University protocols, and routine certifications are conducted of biological safety cabinets and chemical exhaust hoods. Protocols for use of isolation units are posted in those areas. Students are trained in isolation procedures and practice those procedures under supervision in the small and large animal hospital facilities.

3.6 Describe current plans for improvement.

The College’s facilities are generally good and, in some cases, excellent. Planning is underway for a new Microbial Sciences Research Building to be shared with the Colleges of Biological Sciences and Food, Agriculture and Natural Resource Sciences. If funded, this 60,000 square-foot building will be located on the St. Paul campus and will house many of the CVM infectious disease researchers, with an estimated completion date of fall 2016. In addition, the University has recognized the need to replace the 1950s-era veterinary isolation facilities and pre-design activities will commence in 2014. This facility, which will contain BSL2/3 animal biocontainment and procedure facilities, if funded through legislative bonding, could be completed in 2017. Other research lab renovations are being planned for the AS/VM facility to provide improved spaces for multiple-investigator collaborative research.

The College is pursuing a phase II expansion of the Equine Center to add isolation facilities, ICU, an additional surgery suite, faculty offices, and additional student learning space. The expansion would provide improved facilities for service and teaching activities and address operational inefficiencies from having equine cases in two locations. The expansion would be funded through gifts and collegiate resources, and we are currently in discussions with a major donor.

In the VMC, the major project involves the renovation of the current small animal lobby and administrative office area into a Wellness Center, to include exam rooms and treatment area and improved lobby spaces. Fundraising is in process for this planned $3 million renovation. Feasibility study planning has also been completed on changes to the Large Animal Hospital to better use the wards and procedure spaces. The anticipated cost for that project is in the $8-$9 million range.

The Raptor Center has a project currently in pre-design to replace the mews educational display housing and rehabilitation flight pens, with an anticipated summer 2014 completion date.

Planned teaching space renovations include a multi-use teaching space in the VMC/South building that can be used for pathology demonstrations and other teaching needs. Improvements are also planned for the Large Animal Holding facility to better use the space for standing surgery and bovine teaching.
STANDARD 4 – CLINICAL RESOURCES

4.1 Complete Tables A, B and C for the past five years and analyze trends for each species (category).

As illustrated in Tables A, B, and C (Appendix 4-1), the VMC continues to have a strong caseload to support clinical training. This is particularly true in the companion animal hospital, which accounts for 89% of overall VMC caseload. The VMC was significantly impacted over the last six years by the combination of a national recession and increased competition by specialists. The recession decreased demand across nearly all small and large animal specialties, and increased price sensitivity among clients limited the degree to which clients complied with recommendations for advanced procedures. In 2009, a new multi-specialty referral center entered the Twin Cities market, aligning with a chain of cooperatively owned emergency clinics, which has facilitated relatively rapid growth in market share. At the same time, other emergency clinics in the area have added board-certified specialists.

Decreases in hospitalization relative to overall small and large animal caseload reflect a great emphasis on primary care through the VMC’s General Practice service and growth in the hospital’s WMEP. The VMC introduced pre-paid wellness plans for College employees in 2011 to provide students increased access to primary care caseload and healthy pets. The UPet program was well received in the College, and we have since introduced the plan to the University community, albeit with limited promotion due to current space and staffing constraints to growth. The hospital has completed an initial planning phase and is seeking funds for renovated facilities that would accommodate an expanded Wellness Center to meet curricular needs for improved clinical teaching in aspects of preventive health care.

The WMEP, established in 2007, continues to provide large- and mixed-track students exposure to primary care, ambulatory practice at an offsite facility approximately 40 minutes west of the campus.

In-house treatment of bovine cases at the VMC has remained low since the College shifted its bovine focus to the DEC in 2006. Those cases are not accounted for in the VMC accessions tables (Appendix 4-1). Production animal caseload at the VMC is currently composed largely of sheep, goats, pigs, and camelids. Contractual arrangements with nearby Como Park Zoo and the Minnesota Zoo for services provided by a VPM faculty clinician provide student exposure to a variety of exotic species. Contractual arrangements for service by two VPM faculty clinicians for care of a flock/ herd of 600 sheep and goats allow student exposure to routine management and specialized care for these species.

4.2 Describe and analyze the adequacy of normal and clinically diseased animals (hospitalized, out-patient, field service / ambulatory and production medicine) and how they are used for the DVM teaching program.

Companion animal caseload continues to be diverse and robust for clinical teaching purposes. An expanding emphasis on preventive medicine and primary care with ample appropriate caseload and potential for future growth position the College well to meet or exceed the latest recommendations of the AVMA and the AAVMC for veterinary schools to include principles of preventive medicine in their programs. Decreased secondary and tertiary small animal caseload at the VMC over the last six years – while creating budgetary challenges – has reduced some of the pressure that sometimes negatively impacted clinical teaching previously.

Equine caseload continues to be modest and seasonal, creating times during which caseload is less than optimal for clinical teaching. More aggressive marketing strategies and continued emphases on customer service and high-quality care have helped increase the number of equine accessions by 17% this fiscal year-to-date relative to this same time period from FY13. WMEP has maintained a relatively stable caseload over the past five years. Students are scheduled on ambulatory from March through October and participate in all aspects of case care and client communications. With the addition of a third clinician at WMEP, the numbers are expected to increase and the ability to supervise and teach students should be enhanced.
Bovine accessions in the VMC are sporadic and low in number. The bovine instructional programs in individual animal care and production medicine are very well-supported through a combination of pre-clinical and clinical rotations that use a departmental teaching herd, contractual agreements with large dairy and beef producers, and the DEC.

Porcine accessions in the VMC are limited to potbellied pigs. Individual care and production medicine aspects are well-supported by pre-clinical electives and clinical rotations via production companies and veterinary practices in the state of Minnesota.

Students in small ruminant and camelid electives and senior rotations travel to local flocks and herds to provide routine herd health care, field surgery (castrations, C-sections, etc.), and dental work, as well as investigative work-ups. Students are required to keep records, provide client follow-up and education, and perform all work on the farm in a real-life setting.

The VMC does not offer a pet bird or small mammal service. Students can gain experience in these species through numerous externship opportunities in private practices and other colleges. In addition, an elective yearlong course that runs from Spring Semester of Year 1 through the summer and fall of Year 2 provides students with access to veterinary procedures and health care management of species at a local AZA-accredited zoo under the supervision of a VPM faculty member. These students also have access to a small and variable number of zoo and non-domestic animals that are admitted to the VMC for advanced diagnostics and treatment under the supervision of the same faculty member. Students have direct access to handling and management of caged birds and raptors through rotations at TRC.

4.3 Describe unique clinical educational resources or programs that enhance the educational mission.

- Dairy Education Center (DEC) - Based on a 2011 USDA-NRI Higher Education challenge grant, the College dairy educational program was designated a Dairy Education Center of Excellence. This center is located about 1.5 hours from the College and is a partnership with the Davis Family Farms. In 2013, the dairy milked 3,000 cows three times a day in a rotary parlor. It also serves as the dry cow and calving facility for itself and Northern Plains Dairy, a sister dairy of 3,000 cows 10 miles away. Initially, there were 8,000 calvings a year at the facility; starting in 2014, there will be nearly 12,000 calvings per year with the addition of a third large dairy to the system. The DEC facility has three classrooms; wet-lab, clinical pathology, and microbiology laboratories; surgery teaching areas; and dormitory facilities for up to 24 students and two visiting instructors.  

- Golden Valley Animal Humane Society (AHS) – A partnership was formed with Golden Valley AHS to assure continuing access for fourth-year students to rescue animals for teaching spay/castration surgery beginning in February 2014. The goal is to expand this to a complete shelter medicine rotation in the future.

- Miracle of Birth Center – The Miracle of Birth Center is a public exhibit sponsored by the Minnesota Veterinary Medical Association (MVMA) in conjunction with the 12-day Minnesota State Fair, held on grounds adjacent to the St. Paul campus. This exhibit’s goal is to educate the public about farm animal reproduction. Students who take this rotation assist with deliveries of lambs, calves, and piglets, and educate the public about farm animal care and reproduction.

- R&D Systems Farms - The R&D Systems Farm houses 600 sheep and goats used for antibody production. R&D Systems contracts with the VPM department for management and veterinary care. The contract includes access to the farm for student instruction under the supervision of the VPM faculty.

- Equine sports medicine/rehabilitation rotation - The focus of this rotation is on equine sports medicine and related therapeutics, including conditioning, rehabilitation, and chiropractic, taught by a faculty member certified in chiropractic manipulation in animals.
4.4 If off-campus clinical instruction sites are used regularly by multiple students, complete Table D and describe the planning, supervision, and monitoring of students, and contracting arrangements for non-institutional based faculty.

These are not distributed sites in the classic sense, but are instead off-campus facilities where student learning is directed by CVM faculty members. Specific information by site is provided in Table D in Appendix 4-2.

4.5 Describe the involvement and responsibilities of professional students in the healthcare management of patients (and clients) in clinical programs of the college.

Senior students taking VMC rotations are involved in all aspects of patient care from admission and history-taking to physical examination, diagnostic workup, treatment, client education, and discharge. Students work with veterinary technicians as appropriate. On receiving services, students take the history and perform an initial physical examination. Information is reported to the responsible clinician and the problem list and rule-outs discussed. The student with the clinicians formulates a diagnostic plan and communicates that to the client. Treatment or management plans are made based on those diagnostic plans. Students participate in diagnostic testing and procedures for diagnosis and treatment when appropriate. Students are responsible for client communications and record keeping.

4.6 Describe how subject-matter experts and clinical resources are integrated into clinical instruction.

Clinical instruction is team-oriented with faculty, residents, interns, and veterinary technicians working with students to ensure they learn clinical decision-making, discipline-related knowledge and skills, and interpersonal skills. Some clinical rotations are discipline-based, including anesthesia, behavior, cardiology, critical care, dentistry, dermatology, emergency/critical care, medicine, neurology, nutrition, oncology, ophthalmology, radiology, surgery, and theriogenology. Students also have the opportunity to see clinical cases in a more general context in General Practice within the VMC (small animal) and at WMEP and DEC (large animal). Internal referral is strongly encouraged, and students bear the responsibility for working with clinicians to harmonize decisions for their patients.

4.7 Describe the adequacy of the medical records system used for the hospital(s), including field service and/or ambulatory and population medicine. Records must be comprehensive and maintained in an effective retrieval system to efficiently support the teaching, research, and service programs of the college.

Since 2007, the VMC has used an electronic medical record system (EMR) that is essentially “paper-less.” The Universal Veterinary Information System (UVIS) was designed and is supported by the Ross Group, and has been used at 11 different veterinary institutions over the years. The University of Minnesota continues to work closely with peer institutions using UVIS to ensure regular improvements meet changing needs.

Most supporting documents from the referring veterinarian (rDVM) are scanned into the EMR at the time of admission, using a document management system. Students, clinicians, and staff have ready, secure access to the medical record through computer stations located throughout the hospital, as well as at WMEP. In addition, clinicians, students, clients, and rDVMs can access many parts of the EMR from off-campus sites through a secure portal system.

An individual record is created for each animal admitted to the hospital (outpatient or inpatient). Each new client and patient is identified by a sequentially assigned client and patient ID number tracked by UVIS, which prints patient identification labels for all in-hospital record identification that is not electronic. Those supporting paper documents are scanned into the EMR as available or following discharge. The VMC employs both computed and digital radiography, and all imaging is digital and available through its picture archiving and communication (PACS) system. All of this information is attached to the relevant client/patient/visit/procedure and accessible via the EMR.
Medical records, including our PACS system and pathology database, are available to students, residents, and interns for teaching, research and service activities. We have access to several large database systems (VMDB, UVIS, etc.) for both teaching and research. Our faculty members are well-versed in using these systems.

Medical record systems unique to the site are used at outside facilities. At the DEC, students have access to and use the dairy's DairyCOMP herd computer record system to look up individual cow histories, create lists of cows to screen and examine, and manage drug use and proper withdrawal times for milk and meat. Records also are used to investigate herd-level issues such as disease incidence and reproductive performance. Staff are required to maintain records at R&D Farms, but students write reports that are evaluated by faculty. At Golden Valley AHS, students will be using the Humane Solution software that is designed for use by spay and neuter clinics. They will use this program to enter presurgical physical exam findings, anesthesia doses, surgical reports, and records of any other services performed on the rescue animals. They also may have some exposure to PetPoint software, a shelter medicine record system used at AHS, as the program expands to be a more complete shelter medicine learning experience for students.

4.8 Describe how the college has responded to increasing / decreasing clinical resources.

See sections 4.1 and 4.2.

4.9 Describe the means used to maximize the teaching value of each case across the curriculum.

Clinical case material is emphasized throughout the curriculum. In the first-year Physiology course, principles are reinforced with clinical case examples for each of the systems: cardiac, digestive, neural, respiratory, and muscle physiology. Problems of intermediary metabolism (e.g., diabetes mellitus, hyperadrenocorticism, and hypothyroidism) are emphasized in the first-year Biochemistry course, and a series of Clinical Skills courses are offered parallel to the basic science courses during the first two years of the veterinary curriculum. Mini-rotations within the Clinical Skills courses provide students with an introduction to the teaching hospital and reinforce current coursework by discussion about hospitalized patients.

Veterinary students enroll in the Large Animal Hospital Practicum and provide after-hours care for in-hospital and emergency cases. Students receive credit for this educational experience after they complete their shifts, present a verified list documenting completion of the activities and procedures, and present a case in Large Animal Grand Rounds. The number of shifts and complexity of diagnostic and therapeutic tasks increases as the students move through the curriculum. Third- and fourth-year students participate in care of critical animal patients in the Intensive Care Unit in the small animal hospital. Senior students are involved in all phases of patient care, from admission and history-taking to physical examination and diagnostic workup for in-hospital case management. Regular teaching rounds give students exposure to real-life cases.
STANDARD 5 – INFORMATION RESOURCES

5.1 Describe and comment on the adequacy of information retrieval and learning resources.

The UMN library system is the 19th-largest academic library collection in the United States. This system includes over 19 separate locations on the two Twin Cities campuses. Each location and core collection is connected through an automated catalog system. The Veterinary Medical Library (VML), the Bio-medical Library, and the Wangensteen Historical Library of Biology and Medicine are administered together as the Health Sciences Libraries (HSL). The VML contains approximately 70,000 items, while the Bio-Medical Library contains over 562,000 volumes and over 5,000 current periodical subscriptions. The majority of veterinary periodical subscriptions are available in an electronic format. The VML is also migrating to e-books over print whenever possible, both for ease of access and to eliminate need for students to purchase individual copies of textbooks. The VML has a website designed specifically for the needs of the College of Veterinary Medicine: http://hsl.lib.umn.edu/vetmed. The VML subscribes to major journal indexing resources in the health sciences such as CABI, Web of Science, and SCOPUS. It also subscribes to OVID Medline and provides access to PubMed, the two major interfaces to the primary journal index in biomedicine, MEDLINE. The VML is open 65 hours each week.

5.2 Briefly describe the availability of learning and information technology resources support for faculty and students, including personnel and their qualifications.

The Center for Teaching and Learning, the Libraries, and academic technologists collaborate in a highly coordinated model to provide support to faculty in a variety of ways. Many of the support staff have PhDs and years of college classroom experience. In addition, there are technology training services and a mature technology infrastructure that provide access to technologies and applications that faculty and students might incorporate into their practice. Students have additional access to a variety of student support services, including writing support through the writing center and much more.

Librarians can customize a Web page of library resources to support an assignment or course within the veterinary curriculum. Some faculty also add the veterinary librarian as an instructor on their course website to support student research. The Libraries can also give advice on readings, images, video, and other media to enrich online course websites; a copyright librarian with both law and library degrees is available to help faculty navigate copyright issues. Librarians at the UMN have also created and populated digital repositories to support the sharing of scholarship for both teaching and research support: http://conservancy.umn.edu/; http://mediamill.cla.umn.edu/mediamill/.

Library staff can also help instructors find customized course content and materials already purchased through the University Libraries. The Libraries have access to thousands of full-text databases, journals, and e-books that can easily be integrated into the course environment. The Libraries subscribe to RefWorks, an online citation database manager that is used for organizing research and writing papers. The University has also created some proprietary tools to support elearning, such as the student response system Chime-in (http://chimein.cla.umn.edu/) and the video conversation tool Flipgrid (http://flipgrid.com/info/). The CVM has employed an elearning coordinator for the past two years to support faculty in instructional design as well as implementation of elearning components of courses. This position is undergoing change now with a new resource available through the Office of Information Technology (OIT) called the Classroom of Tomorrow, which will assist with design and production of course assets using the Moodle course management system and other tools.

The VML librarian, André Nault, holds a Bachelor’s degree in wildlife biology and a Master’s degree in library science.

Student IT support is provided by OIT Techstop as well as College resources, including departmental and ASA staff, paid student tech workers, and elected student personal technology support representatives.
5.3 Describe the methods of access to library information resources for faculty and students when they are on and off campus.

Access to all electronic journals and books is carried out through Internet Protocol (IP) authentication. As a result, a patron can be sitting in the Library or in a distant corner of the world and have reliable and equal access to all of the Libraries’ resources through an Internet connection. The Libraries have also invested in a website for mobile devices (https://www.lib.umn.edu/mobile/).

Alumni continue to have access to all the Library’s resources if they physically come to the Library; subscription contracts prevent access to electronic resources remotely to non-affiliates. Additional medical databases and journals are available for Minnesota veterinarians through the Electronic Library of Minnesota at http://www.elm4you.org/databases/topics/health. The VML also offers document delivery through the Libraries’ InfoNOW service at https://www.lib.umn.edu/infonow. Alumni are allowed to keep their RefWorks accounts forever at no cost.

5.4 Describe the resources (training, support) available to students for improving their skills in accessing and evaluating information relevant to veterinary medicine for sources in any media.

The Health Science Libraries uses a “liaison librarian” model, which assigns an individual librarian to each AHC college or school. The VML liaison librarian, André Nault, works closely with faculty to integrate evidence-based practice and information skills into the veterinary curricula at logical spaces (such as the Critical Scientific Reading course, the Professional Development courses, and Small Animal Problems). Additionally, he assists faculty with their own research needs, and communicates and consults about new resources and services. In fiscal year 2013 alone, he had 40 separate interactions with veterinary students, interns, and residents within the curriculum, amounting to over 1,400 person contact hours.

5.5 Describe current plans for improvement.

Currently, the University of Minnesota Libraries is rolling out new search functionality in its online catalog called MNCAT Discovery. This federated searching tool will greatly expand and enhance a person’s ability to search and discover books, articles, digital resources, and more through a “blended” search from the Libraries’ website.

The VML is currently located in the Veterinary Science Building, which is a building potentially earmarked for demolition in the next decade. The library has begun planning, and is moving toward a reduced physical footprint and away from print materials toward a more digital collection, with a greater emphasis on a virtual presence.

The CVM is currently developing a plan for more strategic elearning oversight and support through hiring of a technologist to support classroom technology (who will work in concert with the existing central support for classrooms) and a higher-level elearning coordinator to determine strategic direction for elearning to support faculty and students as well as to serve as a liaison with the OIT Classroom of Tomorrow and other central resources.
STANDARD 6 – STUDENTS

6.1 Complete Tables A, B, C, and D, and analyze trends.

See Appendix 6-1 for Tables A, B, C and D.

We accept very few transfer students and have some relative attrition that causes students to move back a year but over time, our student numbers have remained quite steady. As described in Standard 7, we have a strong commitment to improving diversity. Our diversity numbers have improved over the past three years and we are hopeful they will continue to improve now that we have more strategies in place to enhance diversity. The number of affiliate students accepted into the clinical year varies some from year to year. We undertook a systematic approach to evaluating affiliate student performance (grades and clinical competency) and the correlation with our selection process for these students and made some adjustments in the past year in response to this analysis; this may change the number of applicants presented by those schools or the number admitted by the College.

6.2 Provide a listing of student services. These services must include, but are not limited to, registration, testing, mentoring, counseling, tutoring, peer assistance, and clubs and organizations.

Student services include:

- The CVM registrar (a member of the ASA staff) registers all DVM students for core courses and their chosen electives rather than asking students to register themselves through the University system. This allows us to better advise students and ensure that they are registered appropriately. We also advise students on clinical rotations, including 1:1 meetings with every student during the time of rotation scheduling. This includes providing support and advising regarding externship selection and scheduling and ongoing schedule changes throughout the clinical year.
- We coordinate numerous student events, including the Fall Barbecue, White Coat Ceremony, Student Appreciation Week, and Commencement. We also coordinate the Spring Scholarship reception, and provide staff support for the Awards and Scholarship Committee to award over $450,000 in scholarships. We then manage the payment of these scholarships into student accounts.
- The CVM has been fortunate to receive a large philanthropic donation annually to support international student travel in the amount of about $75,000 per year. We coordinate the application process, communicate funding awards back to students, ensure student compliance with University requirements for safety and compliance, and make the transfers into student accounts.
- We have an extensive list of student organizations ranging from species interest groups (Production Animal Medicine Club) to outreach groups (Student Initiative for Reservation Veterinary Services). A current listing can be found at www.cvm.umn.edu/education/currentstudents/studentorgs/home.html. Student Council and SCAVMA are the two general interest student organizations that address student concerns and provide support for student professional development and student life. Our student affairs coordinator works with all of these groups to orient them to University requirements (including annual registration) and to advise them throughout the year. All student groups are registered through the University and have at least one faculty advisor. Advising includes compliance with CVM and UMN policies, facilitation of IACUC paperwork, and trouble-shooting issues that come up throughout the year.
- We recruit and train over 30 DVM students a year to serve as Student Ambassadors as a part of our admissions interview weekends. This provides excellent communication and leadership experiences for participating students.
- We provide extensive support of students with disability accommodations in partnership with the University’s Disability Services office. This involves private testing accommodations as well as other accommodations as prescribed by Disability Services, such as facilitation of captioning, etc.
- Staff in the ASA office provide frequent advising to students on academic concerns, track requirements, immunization requirements (including hosting immunization and titer clinics at the CVM), and personal matters. This includes referral to appropriate CVM or UMN resources. The Gopher Orientation and Leadership Experience (GOALE) is a first-year program that matches students with faculty mentors for a
year-long course, but students have access to ongoing 1:1 mentoring as needed throughout their four years and beyond. We have also created targeted mentoring programs to meet specific needs like clinical rotation selection.

- The UMN has very good counseling resources and we frequently refer students for counseling for personal stressors as well as relevant academic challenges (for example, perception that anxiety may be impacting academic performance). Our VMC social worker also provides initial consultation and referral. University Counseling is located a short walk from the CVM. Boynton Health Service also provides mental health services on the St. Paul Campus (a short walk from the CVM) and Minneapolis Campus (a 15-minute bus ride).

- Faculty often meet with students 1:1 or in small groups to provide additional support within their courses. To supplement this support, we have created VetPAC, a peer-assisted coaching tutor program that trains high-ability students as tutors and matches them with students in academic difficulty. Coaches are paid a small hourly rate. In addition, walk-in coaching is provided, with a VetPAC coach available at the CVM library during specified hours.

- Financial counseling is provided by the Office of Student Finance during new student orientation and near the time of graduation. Our specialist comes to the College to provide this advising and is also available to students throughout their academic program. There is curricular content on personal finances and debt in two required courses (Professional Development I and Practice Management, Law and Ethics) and there are numerous optional seminars hosted through our Veterinary Business Management Association (VBMA) chapter. Information about state residency is provided during the admissions process and also available on the website. The UMN residency officer through the Office of the Registrar determines residency and we refer current students to this office for advising on applying for residency after admission. The CVM does not determine residency and because of this, we are cautious not to provide this advising directly.

- The ASA office communicates with students about NAVLE test dates and sign-up as well as facilitating state licensure support as requested.

- Student use of technology is supported through a number of resources. The UMN has a Tech Stop that provides free support. Classroom Services provides support of the technology in our classrooms and helps oversee our paid student tech helpers, who provide “just in time” support of faculty and students in the classroom.

6.3 Provide a summary of college activities in support of placement of graduates.

Students are provided with several opportunities for career guidance and placement assistance. Lectures are provided twice yearly through our VBMA chapter on job search, résumés, interviews, and negotiations. The VBMA is one of our most popular student organizations, so many students receive guidance through this venue. In addition, all students receive information on résumé-writing and the job search in our core curriculum. Students have the opportunity to submit résumés and cover letters for review and advice from our VMC director, Dr. David Lee. He offers weekly office hours to meet one-on-one with students regarding their job search. He also provides informal review of contracts and recommends negotiation points for fourth-year students, as well as interns and residents at the end of their programs. We periodically survey practitioners to find out who will be hiring and make students aware of open positions, trying to match interests with availability whenever possible.

6.4 Provide academic catalogue(s) and freshman / upperclass orientation materials.

Course Catalog:
www.cvm.umn.edu/education/prod/groups/cvm/@pub/@cvm/@education/documents/content/cvm_content_458022.pdf

Student Handbook:
www.cvm.umn.edu/education/prod/groups/cvm/@pub/@cvm/@education/documents/content/cvm_content_253304.pdf. Much of this information is also covered during new student orientation.
6.5 Describe the system used on an ongoing basis to collect student suggestions, comments, and complaints related to the standards for accreditation.

We collect student input in a number of ways. Standards of Accreditation are posted throughout the CVM. Students provide input through many surveys (course, instructor, curriculum, specific educational resources, etc.) and through student organizations. We specifically ask about concerns regarding how the CVM meets the standards of accreditation on one of our major surveys. Elected class representatives serve as liaisons between their classmates and faculty/administration. Student Council gathers class concerns from students and reports them bi-weekly to representatives from ASA. They also meet on a periodic basis with the department chairs and dean to engage in dialogue about current issues.

6.6 Describe current plans for improvement in resources for students.

We are currently undergoing planning for the hiring of elearning support to better address direct student needs as well as to better support faculty in meeting student needs. We have recently implemented a new plan to better address student needs for parking at the Equine Center and we will monitor that plan and modify as needed. We are looking at options for providing better storage space for first-year students whose locker space is inadequate. We have recently enhanced our VetPAC coaching program by including residents as coaches for struggling fourth-year students when peer coaches are not available because of externships or other schedule constraints.
STANDARD 7 – ADMISSIONS

7.1 State the minimum requirements for admission.

Basic admissions requirements to the DVM program include the following:

- **Pre-requisite coursework:**
  - English (2 courses, 3-5 credits each)
  - Mathematics (Algebra, Pre-calculus, or Calculus, 3-5 credits)
  - Chemistry (General Chemistry w/ Laboratories, 6-10 credits, Organic Chemistry w/ Laboratory, 3-5 credits, Biochemistry 3-5 credits)
  - Biology (Biology w/ Laboratory, 3-5 credits, Zoology w/ Laboratory, 3-5 credits, Genetics, 3-5 credits, Microbiology w/ Laboratory, 3-5 credits)
  - Physics (Introductory Physics I w/ Laboratory, 3-5 credits, Introductory Physics II w/ Laboratory, 3-5 credits)
  - Liberal Education (Social Science and History, 6-8 credits, Arts and Humanities, 6-8 credits)

- Submission of a complete Veterinary Medical College Application Service (VMCAS) application by the VMCAS application deadline with three electronic letters of reference. All transcripts must be received and verified by VMCAS, and Graduate Record Exam (GRE) scores must be from within the last five years. The $85 application processing fee must also be submitted.

- Completion of prerequisite coursework with a grade of C- or better by the end of spring term, prior to the fall semester in which admission is sought. Math and science prerequisite courses must have been completed within 10 years of the application deadline. No more than five science prerequisite courses can be pending completion during the fall and spring semester of the application cycle. Coursework must be taken at a United States or Canadian institution; exceptions may be made for coursework taken abroad that transfers back for credit at the applicant’s undergraduate institution. Minimum prerequisite GPA and last 45-semester credit GPA are 2.75. Applicants are not disqualified if their prerequisite and/or last 45-semester GPA is below 2.75, but no points will be assigned in this/these areas.

- Achievement of a minimum GRE verbal and quantitative percentile rank at the 35th percentile. Applicants are not disqualified if their verbal and/or quantitative GRE scores are below the 35th percentile, but no points will be assigned in this/these areas.

- Participation in a behavioral-event interview.

7.2 Describe the student selection process, including measures to enhance diversity.

All admissions processes are overseen by the admissions director under the supervision of the associate dean of ASA. The Admissions Committee, which is composed of four voting faculty from each of three departments with the associate dean for ASA and director of admissions as ex officio members, makes admissions decisions that are conveyed to the dean. Through the UMN policy of delegation of authority, the dean has delegated the final admissions decision to the associate dean for academic affairs, who works closely with the Admissions Committee and director of admissions to come to this decision and consults with the dean on any issues that may arise.

The student-selection process consists of three steps, and is applied to two pools, resident and non-resident applicants. We currently admit approximately 55 resident and 47 non-resident students. Applicants must meet minimum requirements at each step to advance to the next step of the review process. Those who do not meet the step requirements are no longer considered for admission.

Step one includes an in-depth assessment of an applicant’s academic standing. Specifically, prerequisite course GPA, last 45-semester credit GPA, and GRE scores are reviewed and converted to a point system. This system consists of 75 total points. Twenty-five points are allotted for the prerequisite course GPA and the last 45-semester credit GPA. The GRE is also worth 25 points, with 12.5 points allotted for the verbal score/percentile
rank and 12.5 points allotted for the quantitative score/percentile rank. The following table notes the minimum and maximum distribution of points by academic criteria reviewed.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Total Points</th>
<th>Maximum GPA/Points</th>
<th>Minimum GPA/Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last 45 Semester Credit GPA</td>
<td>25</td>
<td>4.0/25 pts</td>
<td>2.76/.20 pts</td>
</tr>
<tr>
<td>Prerequisite Course GPA</td>
<td>25</td>
<td>4.0/25 pts</td>
<td>2.76/.20 pts</td>
</tr>
<tr>
<td>GRE Verbal</td>
<td>12.5</td>
<td>100th percentile/12.5 pts</td>
<td>35th percentile/.56 pts</td>
</tr>
<tr>
<td>GRE Quantitative</td>
<td>12.5</td>
<td>100th percentile/12.5 pts</td>
<td>35th percentile/.56 pts</td>
</tr>
</tbody>
</table>

Step two includes a review of the applicant’s file by the Admissions Committee to consider non-academic measures. Two members of the Admissions Committee read each file and evaluate an applicant by using a standardized scoring rubric. Faculty members are instructed to notify staff if they have previous knowledge of a candidate so that file can be reassigned. Non-academic measures reviewed include:

- Diversity of veterinary and animal experience
- Responsibility for direct animal care
- Quality of writing
- Personal statement: Knowledge of the veterinary profession and personal future vision
- Degree of involvement and level of achievement within employment and extracurricular activities
- Contribution to diversity according to the CVM diversity statement
- Letters of reference: Knowledge and support of the applicant

The academic and non-academic scores are both converted to 50-point scales and combined to rank applicants. Those who meet a minimum point requirement are then advanced to step 3. The minimum number of points for each step is based in part on historical cutoffs that yield the appropriate number of candidates to move on to the next step and has been modified periodically based on the analysis described under 7.5.

Step 3 is a behavioral-event interview with each candidate remaining in the resident and non-resident pool. Interviews take place on campus and include a tour of the facilities, lunch, an information session, and a question-and-answer panel hosted by Student Ambassadors. Candidates interview with two trained interviewers, typically two faculty members, or a faculty member and professional staff person or alumnus. All new interviewers are required to be trained and all returning interviewers are strongly encouraged to participate in annual training, to ensure consistency in use of interview materials. Interviewers are blinded to applicant information other than name, hometown, and undergraduate institution to prevent bias based on information that has already been scored by the Committee. Applicants are asked to respond to 10 questions by using an example from their past when they solved a specific problem or managed a specific situation. Each question evaluates a competency that predicts success within the profession (Lewis RE and Klausner JS. Nontechnical competencies underlying career success as a veterinarian. J Amer Vet Med Assoc 2003;222(12):1690). The candidate’s answers are then evaluated by the interviewing pair against a series of standardized scoring anchors specific to each competency to rate the applicant’s demonstration of that competency.

Final decisions are weighted one-third on the academic score, one-third on the non-academic score, and one-third on the interview score. The CVM abides by the VMCAS common acceptance RSVP date of April 15. Wait lists are kept for both residents and non-residents. Vacated seats are filled accordingly until the start of the fall semester.

The CVM implemented a diversity statement in 2010 after careful consultation with the Admissions Committee and the Office of the General Counsel of UMN. The non-academic review process was then augmented to include up to five points to be awarded for candidates who possessed characteristics in keeping with the diversity statement. The diversity statement is as follows: “The growing diversity of the nation's population underscores the need to prepare future companion animal veterinarians, food animal veterinarians, public health veterinarians and
veterinary researchers, educators, and scientists who are knowledgeable and sensitive to the population's needs. The College of Veterinary Medicine seeks to admit and educate a diverse student body to enrich the students' educational experience and prepare them to meet the veterinary needs of a multicultural society and a variety of animal species. We aim to meet the current and future needs of the profession while building on our programmatic strengths. Student body characteristics that will enhance diversity in the school include a demonstrated commitment to underserved career paths within the veterinary profession, a wide range of racial/ethnic backgrounds, agricultural background, leadership qualities, and a strong work, community, or public service record.”

The Academic and Student Affairs office worked closely with the CVM Advancement office to identify scholarships that could be given to recruit high-scoring candidates who also possessed attributes found in the diversity statement. Our associate deans of graduate programs and ASA applied for and were awarded a USDA Multicultural Scholars Program grant. The USDA funding supports scholarships and funding for summer experiences for multicultural students with an interest in food animal medicine. The CVM also provides significant scholarships to these students to offset the cost of non-resident tuition for the duration of their attendance.

To meet the increasing demand for veterinarians and to promote diversity within the veterinary student body, the University of Minnesota has introduced the Veterinary Food Animal Scholars Track (VetFAST) and Veterinary Leadership through Early Admissions for Diversity (VetLEAD) programs. VetFAST is an early decision admissions program to recruit high-ability food animal students from UMN undergraduate program partners. Applicants are reviewed after one year of undergraduate coursework based on academics (ACT/SAT scores, undergraduate GPA), experience, letters of recommendation, and interview score. Those accepted must complete all prerequisite courses and earn a UMN cumulative GPA of 3.40 or higher. In addition to the early decision, benefits include mentoring and access to production animal experience (clinical and/or research). Five students admitted through the VetFAST program graduated in 2013, and there are currently 26 students enrolled in the College who entered through this program. VetLEAD creates a pathway into veterinary school for high-ability students at partner institutions. Our current partner is Florida Agricultural and Mechanical University, a historically black university. VetLEAD applicants apply for program acceptance in their sophomore year. Those who meet the program acceptance requirements receive a provisional admissions offer, contingent on the student’s ability to maintain a high academic standing. We have three VetLEAD students who have been conditionally accepted as undergraduates but none have yet matriculated.

7.3 List factors other than academic achievement used as admission criteria.

As described above, step two of the evaluation of applicants includes consideration of non-academic measures and counts as one-third of the final score. The behavioral-event interview evaluates non-technical competencies, including demonstration of communication skills, relationship-building, integrity, judgment, innovative thinking, and adaptability. It also counts toward one-third of the final score that ranks applicants for admissions decision.
7.4 Complete Table A.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>STATE RESIDENTS</th>
<th>NON-RESIDENTS</th>
<th>CONTRACT STUDENTS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A/P** O/A**</td>
<td>A/P O/A</td>
<td>A/P O/A</td>
<td>A/P O/A</td>
</tr>
<tr>
<td>2017</td>
<td>217/56 69/56</td>
<td>814/46 144/46</td>
<td>0/0 0/0</td>
<td>1,031/102 213/102</td>
</tr>
<tr>
<td>2016</td>
<td>188/56 61/56</td>
<td>760/44 132/44</td>
<td>0/0 0/0</td>
<td>948/100 193/100</td>
</tr>
<tr>
<td>2015</td>
<td>233/57 60/57</td>
<td>818/44 128/44</td>
<td>0/0 0/0</td>
<td>1,051/101 188/101</td>
</tr>
<tr>
<td>2014</td>
<td>233/56 57/56</td>
<td>800/44 106/44</td>
<td>0/0 0/0</td>
<td>1,033/100 163/100</td>
</tr>
<tr>
<td>2013</td>
<td>219/61 69/61</td>
<td>865/36 92/36</td>
<td>0/0 0/0</td>
<td>1,083/97 161/97</td>
</tr>
</tbody>
</table>

*A/P = Applications/Positions Available
**O/A = Offers Made/Acceptances

Note: The University of Minnesota College of Veterinary Medicine has tuition reciprocity with South Dakota and a tuition agreement with North Dakota. Applicants from North and South Dakota are considered in the same pool as residents of Minnesota and are therefore not represented in the “Contract Students” category. We do not reserve a specific number of seats just for students from North Dakota or South Dakota.

7.5 Describe current plans for assessing the success of the selection process to meet the mission of the college.

We have conducted extensive analysis over the past six years to evaluate the impact of our selection process and the addition of the behavioral event interview in particular. The results have been presented at national meetings as well as to the faculty. In 2008, we conducted a stepwise regression analysis looking at pre-veterinary admissions variables and academic (GPA and GRE) and non-academic (subjective and interview scores) variables using overall GPA in the DVM program as the dependent variable. We found that academic measures were loosely correlated with performance and non-academic measures were not. This was not surprising because it was in line with what the admissions literature tells us about academic measures predicting academic performance. In a subsequent analysis in 2009 we looked at predictors of struggling in the DVM program, defined as the number of grades below a “C.” We found that verbal GRE and pre-requisite GPA are predictive of performance and the non-academic measures were not correlated (negatively or positively) with performance. At that point, we decided to modify our evaluation of applicants to include the academic score as one-third of the final score. We have continued this analysis to look at the impact of the non-academic measures on clinical competency using data collected throughout our clinical rotations. We found that the interview score has a small but significant correlation with specific clinical competencies. The subjective score was not significantly associated with any outcomes. We have subsequently made some changes to the way the Admissions Committee reviews the files to arrive at the subjective score. We reduced the number of reviewers from three per file to two per file (after running statistical simulations to verify this would not have a negative impact) and engaged the committee to write a more robust standardized scoring rubric with behavioral anchors. We will continue to conduct periodic analyses and plan to publish these results.

7.6 Describe your policies and procedures for admitting transfer students who will receive a degree from your institution, and state the number of transfer students admitted per year for the last five years.

The CVM considers transfer applicants in years two, three, and four of the DVM program. Applicants are accepted on a space-available basis. Placement is contingent on DVM coursework already completed and coursework needing completion at the College. Accepted applicants are placed in the year or semester of the curriculum deemed appropriate after analysis and equivalency of the required courses involved has been verified.
Our transfer policy can be found at www.cvm.umn.edu/education/prod/groups/cvm/@pub/@cvm/@education/documents/content/cvm_content_290328.pdf.

Transfer applications are accepted once each year during a brief application window in April. The breakdown per year is as follows:

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<tbody>
<tr>
<td>Transfers accepted</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>
STANDARD 8 – FACULTY

8.1 Complete Tables A and B, and assess the strengths of the faculty and support staff in fulfilling the college mission.

See Appendix 8-1 for Tables A and B.

The CVM has an outstanding, hard-working faculty and staff that have built and maintained good relationships with the veterinary community, commodity groups, and University colleagues. The faculty are involved with an innovative admissions process and curriculum revision, a growing NIH research program, and successful dual-degree programs (DVM/PhD and DVM/MPH); provide clinical expertise with a large VMC caseload and varied clinical rotation options; provide innovative production animal educational opportunities; and have helped build a successful VDL that meets the demands and needs of the public and area commodity groups. The faculty have been successful in developing industry and government partnerships (e.g., Hills Pet Nutrition for more than 30 years, food safety and security, state and federal government agencies), and have built and lead a strong and financially stable Clinical Investigation Center that supports clinical and translational research through industry partners (e.g., Pfizer Animal Health/Zoetis). We have an entrepreneurial faculty who are involved in the leadership of various centers and unique public/private initiatives. College faculty members are well-represented as specialty college members. Veterinary technical staff often have specialty certification and/or training and, since 2008, all veterinary technicians hired are certified by the state of Minnesota or are eligible for certification.

The majority of College faculty are engaged in scholarly activity and many faculty are actively engaged in clinical teaching and clinical research programs. The latter activity provides a wealth of practical, applied experience that enhances the teaching mission of the College. Additionally, this clinical (revenue-generating) activity demonstrates to the students that the faculty are teachers and active practitioners. An additional strength of our basic and clinical science faculty is their dedication to teaching and to providing quality education to the professional and graduate students. This can be seen in the number of faculty who are actively involved in the scholarship of teaching. Mentoring and informal seminars called Conversations in Teaching and Caffeinated Conversations in Research enhance the faculty’s ability to apply innovative instructional strategies to veterinary teaching and to integrate new content areas.

Many of our faculty members are actively involved in continuing education programs and specialty college meetings. Clinical faculty members often use these venues to improve their clinical and/or didactic teaching skills to the benefit of the students. The College emphasizes the importance of sabbatical and semester leaves in the professional development of basic science and clinical researchers, clinical educators, and clinicians. Professional development opportunities for staff are also supported in the departments and centers.

8.2 State the current number of academic faculty who possess credentials as listed in Tables C and D.

See Appendix 8-2 for Tables C and D.

8.3 Assess the challenges for your college in maintaining faculty numbers and quality.

Recruiting clinical faculty is a challenge because of the number of specialists that are electing private practice careers instead of academia. The College has been relatively successful in hiring clinicians by offering competitive salaries and excellent benefits. However, as the recession subsides and job mobility increases, we anticipate that we will begin to see pressure with starting salaries. Compounding the difficulties in recruiting are private sector salaries that are difficult or impossible to match. Board-certified veterinarians earned substantially more than their non-certified counterparts. Specialty board-certification status has a similar impact on professional incomes of public/corporate veterinarians.
Clinical track and contract faculty are typically provided multi-year appointments at time of recruitment, which revert to annual appointments thereafter. The College has had historically very low involuntary turnover within these types of appointments. However, the College recognizes that multi-year appointments are one element of the total benefit package that can assist in the retention and engagement of clinical and contract faculty. Recent funding constraints (state funding cuts and reductions in clinical income) have affected the College's ability to provide multi-year appointments. The College has a long-term plan to incorporate rolling multi-year contracts at time of promotion as funding stabilizes and when department and center resources are available to do so.

We have had success in hiring by offering initial multi-year appointments and, in the case of research faculty, competitive start-up packages including laboratory renovations/facility enhancements. In some areas, such as pathology, the number of qualified candidates has grown in recent years due to the recessionary impact on the medical device and medical technology industry in the Twin Cities. However, we continue to see significant shortages of qualified candidates for disciplines such as parasitology and anatomy and in other high-demand disciplines such as medical imaging and anesthesiology. We have had success in recruiting students into our training programs and subsequently hiring them in faculty positions. We continue to develop strategies to encourage veterinary students to consider a research career.

A significant challenge is the relative lack of state funding compared to other colleges of veterinary medicine. Repeated and significant cuts have greatly impacted the ability to fund tenure-track and tenured positions, and to adequately address infrastructure and facility renovations, including clinical equipment needs. In the past, the University usually received funds for salary increases each year from a legislative appropriation. A majority of these funds were allocated to colleges or academic units for distribution. The amount of these funds was a specified percent of the previous year's faculty salary budget base. It can no longer be assumed that funding will be allocated under that model.

The President of the University, supported by the Board of Regents, continues to support a management philosophy that focuses on decentralized and shared authority, accountability, and responsibility for academic direction and investment strategies. This philosophy is supported under the budget model by the allocation of revenues and costs to campuses, colleges, and other units. Consistent with this philosophy, the decision-making process and funding sources for the compensation plan, which must address merit and market issues, will be the responsibility of the College. To address the competitive and strategic positioning needs, the Provost’s Office has a compact process to identify strategic initiatives and to invest in the College’s faculty. The compact funds are to support specific proposals. The College has used these funds to target faculty positions and programs given the College’s strategic direction.

Increased time pressure on faculty in clinical teaching programs in the VMC and VDL has occurred due to retirements and other departures. A more recent challenge has been the service delivery model with the clinical-track faculty. For many years, the standard allocation was 80:20, with 80% effort in clinical service (VMC) and the remaining 20% departmental (didactic teaching, research, and professional service). For some disciplines, particularly those with heavy on-call duties, this is high relative to other institutions. The VMC and academic departments currently are exploring other allocation models that may address faculty concerns regarding clinical service time.

8.4 Provide information on the loss and recruitment of faculty.

A number of losses have been faculty members who have left for non-academic positions (pathology, swine medicine, veterinary public health, toxicology). We also lost a number of faculty members to private practice. This has resulted in departures within small animal surgery, ophthalmology, cardiology, and general practice. A smaller number have been recruited by other academic institutions (anesthesia, pathology) and a number were due to retirements. The College has developed a system whereby all proposed faculty positions must be justified by clinical teaching/service caseload needs, didactic teaching needs, and/or research needs to meet the College’s strategic plan. Decisions to initiate the recruitment of faculty positions are made at the College level (with review
and input by the department chairs) rather than solely at the department level. This, combined with the College’s strategic plan, has provided a solid framework for a more targeted recruitment process.

Faculty hired with larger efforts in research have been focused on one of the three signature programs. The cadre of faculty working on infectious diseases has grown, as have those in ecosystem health and oncology. We have been successful in recruiting clinical faculty to replace those that have left, such as in anesthesia, pathology, and ophthalmology. In addition, a number of faculty members have been hired to meet large training components of the USAID RESPOND grant (veterinary public health, epidemiology). We were fortunate to recruit an endowed chair for poultry and other disciplines with significant industry support (swine, dairy, equine).

8.5 Provide a concise summary of promotion and tenure policies, and the policy to assure stability for non-tenured, long-term faculty.

The basis for awarding indefinite tenure is the determination that a candidate's achievements demonstrate the potential for that individual to continue to contribute significantly to the mission of the University and its teaching, research, and service programs over the course of his or her academic career. Although each department has developed its own criteria for promotion and tenure, the primary criteria used are effectiveness in teaching, professional distinction in research, and outstanding discipline-related service.

Indefinite tenure may be granted at any time when the candidate has satisfied the requirements. A probationary appointment must be terminated if the candidate fails to satisfy the tenure criteria by the last year of probationary service, and may be terminated earlier if it appears the candidate is not making satisfactory progress.

For tenured faculty, the criteria for promotion are the same as for tenure. For contract and clinical track, separate promotional guidelines have been developed that allow promotion based on distinction given the individual effort allocation. The stability of the non-tenured clinical and contract faculty is equally important to the success of the College. A rigorous, peer-influenced merit-review process and promotional process and excellent benefits have helped the College assure the stability of the non-tenured faculty, as the process is fair, transparent, and provides equal access to promotion opportunities regardless of tenure status. Promotion and tenure decisions for tenure-track, contract, and clinical faculty are initiated and reviewed at the department level. Candidates are then considered at the collegiate level. The collegiate promotion and tenure committee makes recommendations to the dean. Final promotion decisions for contract and clinical-track faculty are made by the dean. Promotion and tenure decisions for tenure-track faculty are recommended by the dean to the provost, with final conferral by the Board of Regents.

The College has developed standard procedures using the criteria below to evaluate faculty performance annually and determine salary increases: teaching effectiveness, didactic and clinical (includes professional, undergraduate, graduate, and continuing education); research and scholarly activity/productivity; and accomplishments in service (includes professional, administrative, and management). In general, faculty members are evaluated on their performance in each of the three broad areas and then evaluations are weighted depending on the description of the faculty member's duties for the year. A merit point system is used to quantify the faculty member's contributions and assist in determining the salary adjustment. Faculty salary review committees are appointed annually in each department to make recommendations to the chair on the performance of each faculty member. The chairs make recommendations to the dean, who makes the final salary adjustment decisions for the College. Human resources and finance leaders also participate in the calibration meeting with the dean. Equity across disciplines, rank, and other diversity lenses (such as gender, under-represented minority) are also reviewed to ensure fairness and consistency.
8.6 Provide an estimate of the weight assigned to promotion / tenure and / or compensation for teaching, research, service, or other scholarly activities.

The University policy on the relationship of teaching, research, and service to promotion and tenure is that professional distinction, research, and effectiveness in teaching are primary criteria for determining tenure or promotion. Discipline-related service, if considered outstanding, and if this service is an integral part of the mission of the academic unit, can also be used as a criterion. The relative importance of the criteria may vary in different academic units, but each of the three criteria must be considered in every decision. Each academic department has a document that describes in specific detail the criteria and standards to be used for tenure and promotion.

A key element of the merit system is that each element is weighted based on that year’s effort allocation. Faculty effort allocation is decided by the faculty member and his/her chair. The system is flexible in that an individual’s effort can increase/decrease based on the needs of the organization and the faculty’s interest and expertise throughout their career. Each faculty member receives merit pay in proportion to his/her merit score. The merit score is a weighted average of the evaluation scores in teaching, research, and service, where the weights are the faculty member’s workload percentages.

Merit pay is assigned in terms of percentage increases by weighting scores by salary. The merit pay metric assigns each faculty member a share of the merit pool that equals the faculty member’s salary-weighted score divided by the sum across all faculty of the salary-weighted composite scores.

8.7 Briefly describe faculty professional development opportunities available in the college / university.

The University and College are committed to providing employees with professional development and training opportunities. A variety of education, training, development, and consulting programs and services are offered through the provost’s office, Office of Human Resources, Center for Teaching and Learning, and other University offices. Faculty and staff may access services that enhance both their professional and family life.

For example, a number of formal professional development opportunities, such as sabbaticals and single semester leaves, are offered. Faculty members are also eligible to take leaves of absence for purposes that would increase their scholarship, expertise, or ability to carry out the mission of the College or University. This leave may be for periods as short as one or two days, or as long as a year or more. While on leave, faculty members may accept non-service grants for research or study or may augment their sabbatical stipend (50% of base pay) to approximately the level of their full-time salary, provided that the activity for which compensation is received does not interfere with the purposes of the sabbatical. If unusual travel or living expenses will be involved, the augmentation may exceed half salary. A report summarizing the work done is to be submitted within three months after return to the University. Single semester leaves with full salary are for study and research that will strengthen individual knowledge and understanding, and benefit University teaching. These are granted on an all-University competitive basis to full-time, regular appointees holding tenured or probationary appointments. Probationary faculty are eligible for a single-semester leave after two years of academic service. Tenured faculty are eligible for a single-semester leave after four years of academic service. Subsequent single-semester leaves may be taken after four additional years of service. Eligible persons must pledge to return to University service for a full academic year or its equivalent after completion of the leave. Contract faculty are afforded and eligible for the same sabbatical and semester leaves as the tenured faculty.

Clinical-track faculty are provided opportunities for professional development leaves, to include mini, short-term, and extended leaves. Mini-leaves are up to six weeks at full salary and benefits, short-term leaves are 7 to 20 consecutive weeks at 50% to full salary (at unit discretion) and full benefits, and extended leaves are 21 to 48 consecutive weeks at 50% salary and full benefits. Clinical faculty granted a professional development leave must return to the unit granting the leave for a period of time equal to the period of the leave.
In the last five years (inclusive of spring 2014), 3 tenure-track or tenured faculty (1 VCS, 2 VPM) have taken sabbaticals. Two contract and 10 tenure-track or tenured faculty (1 VBS, 3 VCS, 8 VPM) have taken semester leaves, and 2 clinical-track faculty (VCS) have taken mini- or short-term leave.

Leadership development programs prepare and assist academic leaders, managers, and supervisors to perform their roles effectively in support of the University mission of research, teaching, and outreach. The President's Excellence in Leadership program provides leadership development opportunities for high-potential professional and administrative, civil service, and bargaining unit staff. The program features educational and experiential components, and promotes skill development to enhance leadership effectiveness. The Women's Leadership Institute offers University women an opportunity to grow as leaders. Each year, a group of participants meets monthly to encourage self-reflection and learn from each other's skills and experiences. The Successful Manager's Leadership Program is designed to provide leadership development within the context of the University culture and community. It focuses on best leadership practices of University peer managers. Resources for chairs, heads, and directors of academic departments include the Provost's Department Chairs Leadership Program, which includes a leadership competency model, and exposure to best practices at UMN.

8.8 Describe current plans or major changes in program direction that would be affected by faculty retirements, recruitment and retention.

Phased and other planned retirements are used in a number of situations to proactively address program impacts within the departments. Current program considerations include service and teaching commitments in parasitology, outreach, and teaching in global food systems leadership, swine health, and anatomy. These are known in advance and as such, the departments have been able to address potential program gaps. Due to the timing of the retirements, the College had greater flexibility and was better equipped to cover, reallocate, or make program changes.

Retirements have also allowed the College to redirect in focused areas and allow resources to recruit and retain faculty as described in our strategic plan. The College will face challenges in the next 10 years with expected retirements and workforce shortages. It will be critical for program stability to strengthen and maximize opportunities to retain existing faculty and have the ability to recruit a larger share of the next generation.

The CVM is expanding a number of core programs, such as oncology, infectious diseases, and ecosystem health. Through targeted recruitment efforts, a cadre of faculty and staff have been or will be hired, which will establish a critical mass and synergy among these programs. Retention of anesthesiologists continues to be a priority and a struggle given the highly competitive nature of this discipline in both private industry and the public sector.

8.9 Describe measures taken to attract and retain a diverse faculty.

The College has a number of tactical and strategic approaches to attracting and retaining a diverse faculty. Beginning with the search process, department chairs are responsible for ensuring that search committees are diverse, both in the traditional measures of gender, race, and ethnicity and also in rank and type of appointment (tenured, clinical), and for ensuring cross-departmental representation when appropriate. Search committees receive procedures and guidelines regarding their role and responsibilities as well as information from human resources on equal employment opportunity policies and affirmative action goals.

Search committees update recruitment documents and position descriptions that may inadvertently screen out diverse candidates. In some instances, committees have begun labeling some qualifications as “preferred” instead of “required” to broaden the pool of candidates. Additionally, search committees are tasked with developing a recruitment plan designed to attract diverse candidates and typically use multiple, simultaneous recruitment strategies. For example, one measure can be using personal relationships developed by faculty who are already hired.
Advertisements and University resources such as the Relocation Assistance Program highlight features about the University of Minnesota and the Twin Cities that make it attractive to diverse candidates. During the campus visit, the candidates are provided an itinerary that includes meetings with diverse campus and community constituents, and they typically meet with faculty who have similar scholarly interests. Another component is to ensure candidates understand the departmental research, teaching, and service expectations.

Post-hire, all new faculty attend collegiate orientation and are invited to a broader University-wide faculty orientation. Additionally, all new faculty are provided department-specific promotion and tenure documents and mentoring committees (individual or group) are established.

Proactive retention offers are another, more strategic, element of the College’s measures to maintain diversity within the faculty. These retention offers may have a piece related to compensation, but also address effort re-allocation to meet the changing needs of the faculty as well as space and equipment. Some have also included seed funding for research projects.

8.10 Describe programs for on-campus delivery of curricular content by individuals not employed full time by the institution, including subjects taught.

The College does not currently have any programs where the delivery of the curriculum is by individuals not employed by the institution. The College does provide locum coverage for clinical service in instances where faculty may be on leave (such as sabbaticals, other professional development leaves, or longer-term Family and Medical Leaves). The College does have a number of faculty who, for work-life balance reasons, hold part-time appointments. The majority of these cases are female, and the College has seen this as an effective way to retain talented teachers and clinicians in the areas of general practice and small animal internal medicine. There are full-time faculty within these disciplines to ensure continuity.

8.11 Describe the role of interns, residents, and graduate students in teaching and evaluating veterinary students.

Rotating internships at the CVM are typically one-year training programs. Due to the short nature of their appointments, interns have limited roles in teaching and evaluating veterinary students, but may participate with residents in clinical teaching of fourth-year students. It is expected that residents develop effective clinical teaching skills, and it is an expectation of every resident that they are responsible for teaching students in clinics. In some disciplines, residents also participate in teaching laboratories for DVM students. The resident may also be asked to provide some lectures in their discipline-specific courses, at local associations, or to veterinary student clubs. DVM students, particularly in their fourth year during the clinical rotations, will work closely with interns and residents while they are on-clinic, in rounds, and during journal clubs and other related activities. Input may be requested from residents, but final grading is the responsibility of the faculty. Graduate students less commonly interact with DVM students, although they may work with the primary investigator in mentoring students involved in research programs.
STANDARD 9 – CURRICULUM

9.1 State the overall objectives of the curriculum and describe how those objectives are integrated into individual courses.

Upon completion of the veterinary professional (DVM) program, successful students will be able to:

A. Demonstrate understanding of central biological principles and mechanisms that underlie animal health and disease from the molecular to histologic to gross levels and for individuals and populations
B. Demonstrate knowledge of normal function and behavior, pathophysiology, clinical manifestations, diagnosis, treatment, and management or control of important domestic and foreign animal diseases
C. Perform basic technical and surgical procedures in a variety of species
D. Demonstrate understanding of food safety, zoonotic disease, and public health issues
E. Retrieve and integrate information from medical records and the veterinary literature
F. Demonstrate professional and ethical behavior and leadership toward their professional and non-professional colleagues and their clients
G. Display ability and interest in life-long learning
H. Provide adequate patient care, demonstrating ability and desire to minimize animal pain and suffering
I. Demonstrate professional entry-level problem-solving ability and critical thinking skills
J. Demonstrate a professional level of oral and written communication skills
K. Demonstrate basic knowledge of business management and legal issues in veterinary medicine

The curriculum is designed to build competence in students toward these objectives by recognition of the following overall objectives in the first three years of the curriculum:

At the completion of year 1 of the DVM program, successful students will demonstrate knowledge of normal animal form and function, and demonstrate technical competence in handling and restraint and basic physical examination of small animal and large animal species.

At the completion of year 2 of the DVM program, successful students will demonstrate knowledge of normal and abnormal animal form and function, and demonstrate technical competence in handling and restraint, physical and specialty examinations, and core technical skills in small animal and large animal species.

At the completion of year 3 of the DVM program, successful students will demonstrate knowledge of normal and abnormal animal form and function and ability to integrate that information with physical examination findings to diagnose, treat, and control animal disease and to provide preventive care, and demonstrate technical competence in handling and restraint, physical and specialty examinations, and independent performance of core technical skills in a variety of animal species.

The curriculum coordinator works closely with the assistant dean of education, who is responsible for mapping of the curriculum to identify gaps and unintended redundancies, to enhance vertical and horizontal integration as courses are presented and to ensure the collegiate Committee on Curriculum and Educational Policy (CCEP) has necessary information to assist faculty members in crafting courses that provide students with information and experiences in a sequence that enhances learning and retention.

The College educates veterinary students by delivering the most up-to-date scientific information, encouraging leadership, facilitating active and experiential learning, and using technology to enhance learning. The curriculum emphasizes active learning, such as computer-based tutorials, case-based writing assignments, presentations, collaborative learning assignments, and objective structured clinical examinations (OSCEs), as well as traditional hands-on laboratories. Emphasis is placed on concepts, principles, and application in addition to memorization. Case-based discussions have been incorporated through the curriculum. Professional skills and behaviors are introduced early in the curriculum and are reinforced throughout in a series of required courses. Student orientation (GOALE) introduces themes that are reinforced through the curriculum, including personal
management and servant leadership. Clinical skills training is introduced with hands-on animal experience in the first semester of the curriculum, with exposure to common domestic large and small animal species, and exotics.

9.2 Describe major curricular changes that have occurred since the last accreditation.

From 2007-2013, a curriculum that will be henceforth described as the current curriculum was in place. Faculty member groups for each species evaluated species-specific offerings and enhanced courses offered as third-year electives and as rotations within tracks. Collaboration with the College of Continuing Education created an opportunity for interested students to go beyond the curricular offerings in practice management and to achieve a Certificate in Applied Business. Credit hours for some courses, for example physiology and parasitology, were re-evaluated and contact time for those courses expanded or contracted as needed. Instructors applied for direct assistance in improving instructional effectiveness from our educational specialist; many courses were evaluated and several courses underwent extensive revision due to this initiative. Examples include toxicology, which incorporated case-based work in place of rote memorization; nutrition, which permitted students to demonstrate prior knowledge and somewhat individualize their course of study; systemic pathology, which incorporated active learning exercises; and medical imaging, which developed varying methods for student assessment that better mirrored achievement.

University and College mandates for greater efficiency and the need for regular curriculum review as mandated by the COE led to the College to undertake an extensive review and subsequent revision of the curriculum, beginning in March 2011 and accepted by faculty vote in March 2013. What will henceforth be referred to as the new curriculum was introduced for the first-year class (class of 2017) in fall 2013. The classes of 2014, 2015, and 2016 will complete their education in the current curriculum as the new curriculum is rolled in by year; this ensures that no student will be disadvantaged by losing opportunities to work through all materials and experiences. In general, the new curriculum decreases direct student contact time, leaving more time for independent study; ensures student access to material determined to be core for all students while still permitting advanced study by species within the tracked portion of the curriculum; enhances opportunities for integration by consolidation of courses and oversight by a dedicated curriculum coordinator; improves opportunities for distributed student learning by decreasing the number and frequency of examinations as the bulk of the points in a given course; and hopefully decreasing cost of delivery of the curriculum, with the goal of slowing the rise of tuition costs.

9.3 Describe the process used for curricular assessment (including course / instructor evaluation) and the process used to assess curricular overlaps, redundancies, and omissions.

The CCEP is composed of two members from each department and a student member from each class (the voting members), the department vice-chairs, the curriculum coordinator, assistant dean of education, and associate dean of ASA (non-voting members), and support staff. From 2007-2012, all courses, including rotations, were evaluated on a rotating basis by CCEP. Members of the CCEP met with course coordinators to evaluate the course syllabus, materials, instructional methods, and assessments, and reviewed student evaluations of the course and instructors. Reports were brought back to the CCEP as a whole, and when appropriate, recommendations were made to the course coordinator for improvement or requests for assistance in implementation of desired changes in the course addressed. Courses were designated for targeted or comprehensive re-review in one, three, or five years and the outcomes tracked on-line.

As part of the recent curriculum review and revision, an extensive needs assessment was conducted. This included gathering of input from the literature, colleagues who had recently undergone curriculum review and revision, internal and external educational specialists, industry, practitioners, students, and the faculty. As the new curriculum was introduced in 2013, all course coordinators were required to submit a new course request form, the syllabus, and course schedule to CCEP, permitting that body to ensure courses were meeting the guidelines set by the faculty in the approved curriculum and allowing the CCEP to evaluate broadly for opportunities for integration and possible gaps and unintentional redundancies. Because all courses are being evaluated as the
Curriculum is rolled in, the system of regular review described above has been suspended and most likely will be reinstated in fall of 2016.

Course and instructor evaluations are completed on-line by the students using CourseEval and a series of questions mandated by the University, with additional questions regularly evaluated by CCEP; there also is some flexibility for course coordinators to add questions specific for their course. Evaluation of response rate demonstrated that students complete more evaluations in fall than in spring and are less likely to complete evaluations the later they are in the course of study. That same analysis demonstrated that students provide constructive comments using the on-line system. Efforts are underway to increase completion rate to that seen in first-year fall, which is nearly 75%.

Comprehensive semester evaluations are completed on-line by the students using CourseEval. These evaluations are open throughout the semester so students can enter concerns or kudos in real time. Compiled results are periodically brought to CCEP for consideration.

The collegiate educational specialist conducts Critical Incident Questionnaires (CIQs) one or more times during the semester, soliciting student input on strengths and weaknesses of courses for formative assessment and implementation of change, if necessary, during the semester. Information is made available to course coordinators and to the CCEP.

Curricular overlaps, redundancies, and omissions are assessed by the CCEP during review of new courses in the curriculum, as described above. The curriculum coordinator meets with course coordinators for a given semester as a group and maps topics for each course horizontally to identify opportunities for integration and sites of unintended redundancy. The assistant dean of education has mapped topics from all courses in the current curriculum and determines for each course in the new curriculum whether those topics are still present. If topics are not present, the assistant dean meets with the relevant course coordinator to determine if this was an intentional removal of material that is no longer considered core or will be presented in another course, or if a gap truly exists. Similarly, redundancies are addressed by discussion with course coordinators. Any specific concerns are brought to CCEP and discussions facilitated to ensure there are no unintentional omissions. An example is neuroembryology. In the current curriculum, this was covered in a neurobiology course that has since had content moved into physiology, and gross and microscopic anatomy. A decision was made after discussion with course coordinators to provide this as an on-line module in the physiology course in the new curriculum.

9.4 Describe the strengths and weaknesses of the curriculum as a whole.

Curricular strengths include flexibility, early introduction of clinical exposure, dedicated courses on nontechnical competencies, a large selection of clinical rotations, high small animal caseload, creative collaborations for extensive large animal caseload (DEC, WMEP), mentored research experiences (Summer Scholars, dual-degree PhD program), emphasis on public health (including dual-degree MPH program), provision of state-of-the-art teaching facilities (Active Learning Classroom, Surgery and Clinical Skills teaching laboratory), and internationally-recognized, award-winning teaching faculty who are supported by an on-site educational specialist.

Weaknesses in the current curriculum included too much passive coverage of content, not enough hands-on clinical skills (including anesthesia and surgery before the clinical year), lack of integration (especially vertically), and a lack of clinical reasoning (problems-oriented approach vs. systems approach) before the clinical year. Attention has been paid to these concerns in the new curriculum with increased active learning, increased attention to clinical skills training and collaboration with a local humane society to ensure consistent availability of dogs and cats for surgery training through spay/castration surgeries, oversight of integration by the curriculum coordinator, and requirement for all students to take problems courses to foster critical thinking and clinical decision-making skills. Lack of availability of small animal cadavers has become a concern in the past year and has led to creation of a new paradigm for clinical skills laboratory teaching that includes greater use of models, use of tissues or cadavers from other species for practice of transferable skills, and increased efficiency of
animal/tissue use and faculty time by creation of a daylong clinical skills laboratory experience that will be piloted in spring 2014 with members of the current third-year class. An ongoing weakness is unequal distribution of staff between departments to support technology-enhanced learning, reflected in the curriculum as inconsistent availability of materials to students both in timeliness and organization.

9.5 Describe preceptor and externship programs (including the evaluation process).

Preceptors are practitioners who provide students with exposure to practice early in the curriculum. Preceptors are identified with assistance from staff and, after agreeing to host students, are sent materials regarding expectations of the College for the student experience, including clinical skills and communications opportunities. Students complete evaluations after the preceptor experience, and those preceptors that are not considered valuable are not placement sites for the next year. Preceptors note attendance of students and contact the College with specific concerns. They may be asked by the student to sign off on demonstration of clinical skills, if appropriate at that site. Preceptors do not directly grade the students. The Alumni and Friends Society of the College also provides students with mentoring experiences with practicing veterinarians that are intended to be more about personal growth than skill acquisition; the College is encouraging collaboration so as to permit identification of which practitioners are best suited and most desirous of these differing roles.

Externships are clinical-year experiences, usually lasting two weeks. Some externships require a longer period of exposure; for example, many zoo and wildlife externships require four weeks or more to ensure students have extensive enough knowledge of animal handling and husbandry to interact safely with the species involved. The clinical year/externship coordinator in the office of the associate dean of ASA manages a robust on-line database of externship sites and is available to answer student questions regarding sites commonly visited, including type of caseload seen and amenities included with the visit (lodging, emergency experience, etc). Students complete an evaluation after completion of the visit, and those evaluations are available to their classmates and to students in subsequent years. Veterinarians directly grade the students as nonsatisfactory, incomplete, satisfactory, or outstanding, with described anchors, using an externship assessment form available to them on-line. Sites determined to be inappropriate based on verified student feedback, lack of cooperation in student grading, or other concerns, are removed from the database. Students are permitted to visit externship sites that were not previously in the database and are strongly encouraged to provide substantive feedback for the benefit of future students.

9.6 Curriculum Digest

See Appendix 9-1 for a graphic depiction of the curriculum and the curriculum digest.

9.7 Describe current plans for curricular revisions.

See section 9.2.

9.8 Provide a description of the testing / grading system and the procedures for upholding academic standards.

In didactic coursework, a grading scale of A-F (including plus/minus) or pass/fail is chosen by the course coordinator and approved by CCEP. Pass/fail grading primarily is reserved for courses providing information and experiences in nontechnical skills (for example, Professional Development course series). Norm-referenced grading is used by only one discipline (medical imaging) and has been demonstrated by that instructor not to disadvantage the students. Criterion-referenced grading is used for all other courses. Clinical rotations are graded A-F using a standardized rotation assessment rubric with well-defined anchors.

Our Academic Standing and Dismissal Policy can be found at www.cvm.umn.edu/education/currentstudents/policies/home.html. The associate dean for ASA monitors student progress and addresses with course coordinators any didactic course or rotation with which students appear to struggle unduly. Students who fall below the standards set forth by this policy meet with the Student Promotions Committee to discuss their specific circumstances. In many cases, students are allowed to develop a remediation
plan and to come back after they have completed that plan. CCEP assesses learning objectives and alignment with appropriate assignments and assessments as courses are reviewed, and brings to course coordinators directly any concerns regarding grading not truly reflecting student achievement in the course.

9.9 Describe the opportunities for students to learn how different cultural and other influences can impact the provision of veterinary medical services.

In the core Professional Development series, students are exposed to cultural competence as an idea and practice. “The goal of this session centers around delineating differences in communication styles. Within class you will be presented with explanations and examples of various communication styles. You will identify your preferred communication style and the communication preferences of some of your classmates. You will also have the opportunity to interview an international student. The objectives of this activity are to gain experience conducting an interview with someone from a cultural background different from your own in order to gain a perspective on their background and develop an understanding of their view of medical care related to animals in their country. Gaining an understanding of your future clients is key to establishing trust, uncovering the whole story and partnering with them in the care of their pets. It is critical to realize that not all your clients will think that your recommended plan of treatment is what they desire. You must establish rapport with your clients so that you can work with them to develop a plan that takes into considerations their situation, and their beliefs.”

In the elective International and Cultural Immersion course, students are provided with information about cultural competence and safety when traveling abroad. This is a very popular class, with approximately 65 students enrolling each semester. Students who have taken this course are eligible to apply for international travel grant funding. Each year, up to $75,000 has been awarded, with students traveling to locations around the world to engage in clinical, research, and outreach activities.
STANDARD 10 – RESEARCH

10.1 Describe up to five programs of research emphasis and excellence that integrate with and strengthen the professional program.

The CVM is uniquely positioned to provide solutions to current and emerging problems at the interface of animals, humans, and the environment that threaten animal and human health. Based on the concept of One Medicine and One Science, the CVM emphasizes integration of research into education, clinical service, and public translation. In line with this mission, the CVM strives for research excellence in three signature program areas of critical importance and need: emerging and zoonotic diseases, comparative medicine, and population systems.

**Emerging and Zoonotic Diseases Signature Program** - The guiding principles of this program are to detect new and re-emerging infectious diseases through surveillance built on tools derived from comprehensive understanding of host-pathogen interactions; to understand the host and pathogen responses as a function of the environment in order to comprehend the factors leading to pathogen emergence and develop a rapid-response team to investigate new diseases as they emerge (or re-emerge); to develop science-based control and intervention programs; and to develop models to predict host/pathogen/environment interactions with the goal of predicting disease persistence, transmission, and emergence/re-emergence.

**Comparative Medicine Signature Program** - The guiding principles of the Comparative Medicine program emphasize interdisciplinary and collaborative research with investigators across all three collegiate academic departments (VBS, VCS, VPM), the College centers (VMC, VDL, CAHFS), other units in the AHC, the College of Biological Sciences, and College of Food, Agricultural and Natural Resource Sciences on the St. Paul campus, and several other University centers and institutes. The advent of translational medicine provides the College with an additional opportunity to test cell-, small-molecule-, and gene-therapies in animal models of the human condition. Core strengths in Comparative Medicine include oncology, inflammatory and chronic diseases, and molecular and genetic models of animal disease. Research programs in Comparative Medicine span the continuum from basic to clinical and translational research; some components of this program are designed to investigate basic biology and underlying mechanisms of disease, while other components study diagnosis, treatment, and prognosis of disease.

**Population Systems Signature Program** - The guiding principles of this program center around the zoonotic nature of many emerging agents and their potential impact on wildlife. This program highlights three focus areas designed around the three crucial, intersecting areas in population systems: ecosystem health, livestock health, and global food systems.

In his third year as president of the University, Eric Kaler continues to be focused on core priorities: academic excellence, access for qualified students, stewardship of tuition and public dollars, a world-class research enterprise that aligns with the needs of the state of Minnesota, and a deep commitment to public engagement and outreach, locally and globally. During the 2012-2013 academic year, and in his first biennial budget request to the Minnesota Legislature, Kaler forged a partnership with the State of Minnesota by achieving $35.8 million in research investments from the state. In an initiative called MnDRIVE – the Minnesota Discovery, Research and Innovation Economy program – research emphasis matches some of the University’s research and discovery strengths with the state’s most pressing needs and key industries. The College has a prominent role in the global food initiative of MnDRIVE. This year, Kaler and the University community are engaged in a consultative strategic planning process to set the institution’s course for the next decade.

10.2 Provide evidence for the breadth and quality of the college research program.

See Appendix 10-1 for required tables.
Faculty are reviewed annually for their accomplishments in research, teaching, and service broadly defined, and these accomplishments are documented on faculty curricula vitae and through annual merit review and goal-setting. Both quantitative and qualitative measures of research productivity are used to assess faculty. These include scientific publications, other measures of scholarship such as scholarship of teaching and learning, presentations at national and international meetings, and record of research support. The quality of the publications are judged based on the impact or significance assessed by the influence of the work on others, research as measured by citations, and scholarly reputation of the publications. For grants and other research support awards, faculty are evaluated based on the number of grants submitted, the number awarded, and the dollar amounts awarded. For presentations, faculty are evaluated based on quantity and quality, including location and type of the presentation. It is expected that research productivity should correspond to percent research effort as described in Standard 8.

As documented by the CVM research expenditures data, CVM faculty participate in a high volume of sponsored project activity, and this funding portfolio is quite extensive, including funding from groups such as the Department of Defense, NIH, USDA, American Kennel Club Canine Health Foundation, Morris Animal Foundation, and American Quarterhorse Association, among others.

See Appendix 10-2 for selected highlights of research accomplishments of CVM faculty during the past three years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of students in funded &amp; unfunded research projects</th>
<th>Number of peer-reviewed publications in which DVM students are authors/co-authors*</th>
<th>Number of veterinary medical students in a joint DVM/graduate academic program</th>
<th>PhD (or equivalent)</th>
<th>Master’s (or equivalent)</th>
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<td>Year 2013</td>
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<td>2 (+3 admitted)</td>
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<td>28</td>
</tr>
<tr>
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<td>3</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Year 2011</td>
<td>70</td>
<td>4</td>
<td>3</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Year 2010</td>
<td>46</td>
<td>2</td>
<td>5</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Year 2009</td>
<td>45</td>
<td>4</td>
<td>5</td>
<td>21</td>
<td>21</td>
</tr>
</tbody>
</table>

* Please note that the College has not had in place a mechanism for tracking student publications and believes that these numbers underestimate this value. A mechanism to better capture this data is being developed and will be used for data collection for future reports.

10.3 Describe the impact of the overall research program on the professional program and on professional students.

Curriculum – All students are required to take a course in Critical Scientific Reading in the first year. In this course, they practice how to systematically review a scientific paper, including acknowledgement of type of paper (basic research, prospective clinical trial, review paper, etc.), review of materials and methods to determine reproducibility of results, basic review of statistics applied, and merits of the discussion and conclusions drawn. First-year students also receive “just-in-time” training from the librarian regarding literature search to support course work in core courses (for example, Agents of Disease) and elective courses (for example, Clinical Correlations) that require identification and assessment of pertinent literature. Finally, first-year students receive information about animal use in the curriculum, including in research, as part of their Professional Development training. Second-year students do not have targeted training in research topics but are expected to access and interpret pertinent literature in many didactic courses, especially those that focus on cases as a primary teaching methodology (see Curriculum Digest). In the third year, all students again receive training and practice in identification and assessment of pertinent literature in their final Professional Development course, in which they...
are learning the principles of evidence-based medicine as they learn the problem-oriented clinical decision process and how to write medical records. In the fourth year, interested students may pursue the Research/Public Health track for their clinical training, which combines necessary clinical training with a strong focus on research methodologies and practice. Students participating in our Veterinary Summer Scholars program (see below) also have the option of earning two elective credits in our Directed Research Course for their research activities. Co-curricular opportunities include the Research Animal Medicine (RAM) Club. The RAM club provides exposure and education opportunities focused on research in the animal medicine world. Examples include journal club, laboratory tours, and educational workshops.

Research opportunities – The CVM has fully embraced the Veterinary Summer Scholars program initiated 14 years ago by Merial. Summer Scholars information is provided during the initial interview process and research careers for veterinarians are discussed during GOALE. The faculty lead for Summer Scholars also presents a 15-minute description of the program, its purpose, and how to apply during the first month of the freshman year, and also communicates with the students by e-mail to announce when the program projects are available for review and when applications are due. In addition to the three or four positions funded by Merial annually, the CVM provides an additional four matching stipends, currently has an NIH T35 program to support four positions, and solicits stipend support from various research centers. This allows students to be involved in not only biomedical research (the focus of the Merial and NIH support), but also to work on agricultural and companion animal research projects if they so choose.

Faculty projects are assembled in late fall by recruiting faculty from the CVM and across UMN who agree to mentor a DVM student for the coming summer. The selected projects are posted on a central website (www.cvm.umn.edu/education/currentstudents/summerscholars/home.html), and students have six to eight-weeks to meet with possible mentors and prepare an application that includes an experimental outline, specific aims, and rationale for their interest in research. Projects/applications are selected for funding by a panel that includes the CVM associate dean of graduate education, the directors of our graduate programs, and the director of the NIH T35 grant. Students are notified by mid-March and can begin their research at any time, although the official program start is the end of May (semester end).

In addition to their research experience within their particular project, Summer Scholars convene bi-weekly to discuss such topics as research ethics, research careers for veterinarians, applying to and succeeding in PhD programs, and experimental design. Field trips to the research laboratories at local surgical or biomedical research companies are often included. The CVM provides funding such that all students (not only those funded by Merial) attend the national conference and present a research poster. There, they get to interact with peers from other institutions and are provided a broader picture of research opportunities and approaches. Finally, all Summer Scholars present their posters at the CVM Points of Pride Research Day in the fall, during which they interact with PhD students, post-doctoral researchers, and hospital residents. Posters are judged by a faculty panel via student interviews, and the top performers are awarded a small prize.

Concurrent or subsequent graduate education – We employ several mechanisms to draw DVM students into subsequent graduate education. Foremost is our formal dual-degree program, in which select students (approximately one per year) are able to expedite the time required to earn both degrees. We formally funded a DVM/PhD program that admitted one student per year. Students were selected at the end of their second DVM year to complete three to four-years of PhD coursework and thesis research. Upon completion, students returned to the third-year DVM curriculum and were provided a tuition waiver for the remaining five semesters. Note that beginning with the class entering in fall of 2013, we now formally accept two DVM/PhD students into the program. All applicants who are invited for a DVM interview are contacted by e-mail regarding the DVM/PhD program. If they so choose, they then submit additional materials that include letters of reference regarding their research aptitude and a personal statement of interest/career goals. The top five such applicants are selected by the associate dean for graduate programs and the directors of graduate study, and they undergo an additional one-hour interview while on campus for their DVM interview. Selected students have the option of completing the PhD between years two and three of the DVM curriculum (plan 1) or after year four (plan 2). They begin research investigations in the summer between their first two years of DVM training. Students who complete the PhD
receive either a tuition waiver for years three and four of the DVM curriculum (plan 1) or a higher stipend during the PhD training (plan 2) paid for by the CVM.

Senior students are contacted by e-mail and invited to apply for our NIH T32 Training Grant, which specifically funds post-doctoral comparative medicine and pathology training within our Comparative and Molecular Biosciences PhD program. Graduates who matriculate to our residency tracks are encouraged to simultaneously complete a Master’s degree within the Veterinary Medicine graduate program. Each year, one or two University of Minnesota DVM graduates enter a residency at the CVM and also join the graduate program. Approximately 60% of the approximately 65 PhD and MS trainees in the College also hold a DVM or foreign equivalent degree. Currently, four such students are graduates of the College’s DVM program who directly matriculated to an MS or PhD program.

Seminars and presentations – All DVM students are made aware of collegiate and graduate program seminars through our biweekly CVM newsletter, which lists upcoming seminars, including our regularly held CVM Research Seminar that features both UMN faculty and invited external speakers. Seminars cover the range of research areas, including human-focused biomedical research. All programs are open, and DVM students are welcome to attend. In particular, no first-year classes are scheduled on Thursdays from 8-9 a.m. to allow students to attend the weekly VCS Grand Rounds, which often presents current research.

As described above, veterinary students participating in Summer Scholars present their work at least three times: during the practice session to their peers and advising faculty just prior to the National Merial Conference; at the national conference; and again during our CVM Points of Pride Research Day. Attendees for this last event include CVM faculty and technicians, hospital personnel, representatives from local biomedical and veterinary health companies, agricultural groups, and UMN administrators from affiliated colleges. Research Day consists of a full day of poster presentations by Summer Scholars, graduate students, and post-doctoral researchers. Summer Scholars posters remain on display outside the two main lecture halls for one full week to allow other DVM students to peruse them as they have time. Typically, approximately 80 posters are presented over a two-hour period (presenters attend their posters for one hour, then have one hour to view other posters). As part of this celebration, a nomination and evaluation process selects a Distinguished Research Alumnus who visits with our students and presents an overview of their research highlights. This is also the forum in which our annual Pfizer (now Zoetis) Faculty Research Award is presented.
STANDARD 11 – OUTCOMES ASSESSMENT

11.1 Student educational outcomes

Table A – NAVLE

<table>
<thead>
<tr>
<th>Year</th>
<th>Students taking exam(s)</th>
<th>Students passing exam(s)</th>
<th>Average scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>95</td>
<td>90</td>
<td>512</td>
</tr>
<tr>
<td>2012</td>
<td>88</td>
<td>87</td>
<td>524</td>
</tr>
<tr>
<td>2011</td>
<td>90</td>
<td>87</td>
<td>521</td>
</tr>
<tr>
<td>2010</td>
<td>81</td>
<td>79</td>
<td>539</td>
</tr>
<tr>
<td>2009</td>
<td>87</td>
<td>87</td>
<td>535</td>
</tr>
</tbody>
</table>

Table B – Attrition

We have reported for the classes graduating in 2013 and back five years, indicating the anticipated graduation date for those entering in 2004-2009. As described under Standard 7, after extensive examination of various outcomes, including academic difficulty, we have adjusted our evaluation of applicants to consider academic performance in the final decision for the Class of 2015. While we have seen some relative attrition for personal reasons in that class, there has been none for academic reasons so far.

<table>
<thead>
<tr>
<th>Entering Class</th>
<th>Attrition*</th>
<th>Reason for Relative Attrition</th>
<th>Absolute Attrition**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Academic Failure/Additional Program</td>
<td>Personal</td>
</tr>
<tr>
<td>2009 (2013)</td>
<td>6</td>
<td>2/0</td>
<td>1</td>
</tr>
<tr>
<td>2007 (2012)</td>
<td>8</td>
<td>1/3</td>
<td>2</td>
</tr>
<tr>
<td>2006 (2011)</td>
<td>6</td>
<td>0/2</td>
<td>2</td>
</tr>
<tr>
<td>2005 (2010)</td>
<td>9</td>
<td>2/2</td>
<td>0</td>
</tr>
<tr>
<td>2004 (2009)</td>
<td>3</td>
<td>0/1</td>
<td>0</td>
</tr>
</tbody>
</table>

* Students that are either withdrawing from the program or moving to a different (earlier) class  
** Students who leave and never return

Competency assessment – Clinical competency is assessed using longitudinal tracking of individual student demonstration of competency in the clinical year. We use a standard rubric in all clinical rotations (with minor variation in a select few courses) and faculty assess student competency on a five-point scale in three areas: knowledge, clinical skills, and professionalism (Appendix 11-1). The faculty member responsible for submitting these scores consults with the other faculty, house officers, and technicians who observed the student directly and gathers input about student strengths and weaknesses. Students are given formative feedback throughout the two-week rotation as well as a mid-block assessment, especially if the student is struggling. These competencies are more specific than the nine described in the standard, and we have mapped them to the nine (Appendix 11-2). Students who fall below “competent” in the same competency in more than one rotation (i.e. earn a sub-competent score of one or two on the five-point scale) are flagged and required to meet with the associate dean of ASA to identify factors that may be contributing to the student’s struggling and to develop a plan for improvement. If that student earns a deficient score in the same competency a third time, the student will be required to develop a remediation plan with input from the faculty who worked with the student.
Then an individual reassessment plan will be employed using faculty who did not previously assess the student to specifically assess the student’s competency in the deficient competency(ies). In some cases, a student is able to demonstrate improvement through achievement of competent scores in subsequent clinical rotations without further struggling and the stand-alone reassessment is not necessary. Students are allowed up to three reassessment attempts. As outlined in our Clinical Competency Assessment Policy, “Any student who fails to demonstrate clinical competence as defined by this policy will not be granted a diploma and will be referred to the Student Promotions Committee for dismissal.” It is our goal to support students to achieve competency and we have been successful in doing so since implementation of this policy. The Class of 2012 was the first to be held to this policy, and seven students received warnings for multiple deficiencies. Of those, one went on to earn a third deficiency and required remediation and reassessment, one failed out of the curriculum after earning a failing grade in a rotation (not for clinical competency deficiency), and the rest improved and did not receive further action. The Class of 2013 had five students who received warnings. Of those, two went on to earn a third deficiency and required remediation and reassessment. Since implementation of the policy, an additional five clinical affiliate students received warnings and three of those went on to require remediation and reassessment.

In addition to the longitudinal assessment of competency, there are also other direct observations of student competency that occur in different ways in various rotations. For example, student communication with clients is videotaped in General Practice to assess and improve student skill. In Radiology, students are given “unknown” cases and assessed on ability to correctly interpret findings. There are many other such examples of rotation-specific direct assessment of competency that contributes to the student’s grade in the rotation rather than to longitudinal assessment.

Employment rates – Surveys of graduates have typically yielded low response rates. Survey respondents also report that it is hard to differentiate what was learned in school versus on the job by three and five years post-graduation. In response to this feedback we simplified the survey we had been using and began administering it at 9 and 18 months post-graduation rather than at one, three, and five years post-graduation. As a result, we did not have data that showed employment rates at one year post-graduation after the class of 2010. We conducted a separate survey in spring of 2013 in response to the AAVMC request for this data and have reported that data for graduates in the classes of 2011 and 2012.

Table C – Employment Rates

<table>
<thead>
<tr>
<th>Graduating class</th>
<th># Graduates who received employment or advanced training offers / # completing this question, and (%)</th>
<th>Mean # employment or advanced training offers received</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>60/87, 69%*</td>
<td>1.6*</td>
</tr>
</tbody>
</table>
| 2012             | 44/79, 55.7%*  
AAVMC empl. survey 64/68=94% | 1.7*                                                |
| 2011             | 64/86, 74%*  
AAVMC empl. survey 69/71 = 97% | 1.5*                                                |
| 2010             | 55/ 79, 69.6%*  
1 year alum survey 19/19=100% | 1.8*                                                |
| 2009             | 62/62, 100%*  
1 year alum survey 31/32 = 97% | 1.8*                                                |

* AVMA Survey of Graduating Veterinary Students data collected in the months prior to graduation, not at one year post-graduation.

Student surveys – As described above, we have changed the timing of our survey of alumni to improve response rates and to garner more reliable feedback, based on graduate comments about their ability to provide an accurate assessment of their acquisition of knowledge and skill from their education as opposed to on the job. Regardless of the timing of the survey, we have consistently used the information we collect to inform the CCEP in decisions about courses and curriculum and later to inform the curriculum revision.
Survey results confirm that we are meeting veterinary graduate expectations. Percentage of respondents that strongly agree or somewhat agree with the statement “I feel that the College prepared me well for my career” are shown in the table below, both at the time of graduation and one year out (except the Class of 2013).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>% at time of graduation</td>
<td>81%</td>
<td>84%</td>
<td>89%</td>
<td>89%</td>
<td>88%</td>
<td>90%</td>
<td>85%</td>
</tr>
<tr>
<td>% one year post-graduation</td>
<td>86%</td>
<td>98%</td>
<td>100%</td>
<td>97%</td>
<td>95%</td>
<td>98%</td>
<td></td>
</tr>
</tbody>
</table>

In addition to quantitative results, we use comments to help guide curricular decisions. Examples of changes that have been made in the current curriculum include reinstatement of the Clinical Laboratory Medicine Rotation and addition of this course as a requirement for all tracks, and improvement of several courses in areas graduates identified as weak (e.g. pathology, radiology, toxicology) through work of these faculty groups with our on-site educational specialist. Many areas of concern identified by graduates are being addressed through the implementation of the new curriculum. Examples include increased focus on clinical application and decreased focus on memorization of details (virology, parasitology, bacteriology), greater integration of content within semesters (biochemistry, nutrition, physiology, and microanatomy) and across years (thematic emphasis on preventive medicine, problems courses added as core), and greater focus on skills and knowledge required for private practice (clinical skills, preventive medicine, general practice).

Employer feedback – Our primary vehicle for collecting employer input about our graduates is through periodic focus groups (on a six-year cycle) facilitated by outside consultants. The most recent focus group was conducted in 2009, and we plan to repeat this in 2015. In 2009, the goal was to determine employer satisfaction with the on-the-job performance of graduates of the College, the practical (clinical and diagnostic) skills of graduates, the technical and non-technical competencies of the graduates, and the employers’ perceptions of areas to target for curriculum improvement. In addition, we were looking for employer input on a particular area of the curriculum, pharmacology, in response to input we had received on graduate surveys and student performance on the Qualifying Exam that was administered to our students in 2007 and 2008, in part to see if it would be a useful tool for curriculum assessment. Overall, employer satisfaction with on-the-job performance ranged from moderately happy to happy (no scale provided). Several noted that the College’s graduates clearly distinguish themselves from their peers in the areas of interpersonal skills and work ethic. They also highlighted the fact that they were relatively happier with recent graduates, in particular with their ability to find and evaluate information, their level of medical knowledge, amount of time spent on clinics, and the mentoring they received in school. Although skills in general were rated as good, practical skills, such as surgical and routine handling skills, were sometimes deficient. Additionally, they felt new graduates were not always strong in client communication and demonstrated lack of confidence in their skills (e.g., surgery). Graduates were sometimes too prone to refer a case. Another challenge of graduates noted was that of gaining business and financial acumen—understanding how business works and how business and financial goals are translated into action. Participants noted that although there are exceptions, graduates of the CVM generally excelled in client communication (in contradiction to their report that some graduates lack communication skills), knowledge and resourcefulness, honesty, trustworthiness, and professionalism. The CVM was commended for interviewing students for non-technical competencies as part of admissions. We have used this information both to inform the CCEP in decisions about the current curriculum and to inform curriculum revision.

Instructor feedback – Faculty frequently present specific ideas or concerns to department chairs and the ASA office about minor needs to support teaching, and those needs are addressed as feasible. Examples include requests for funding for new equipment or supplies (e.g. ultrasound machines for theriogenology, microscopes for laboratories, iClickers for lecture rooms), concerns about facilities (the former Student Surgery Laboratory, the previous lack of active learning spaces, the Large Animal Holding facility), or the desire to conduct scholarship of teaching and learning projects. We have initiated periodic requests for funding proposals as well as responding to needs as they arise. We conduct a more formal survey of faculty and instructional staff using a survey tool that was most recently administered in 2011. The same instrument had been administered in 2006, so we were able to compare responses. We found overall improvements in the following areas: satisfaction with classrooms,
supplies, equipment, elearning support, departmental support, and faculty development of teaching. There was a decrease in satisfaction with clinical resources but in follow-up focus groups, it was identified that the case resources were more than adequate and the gap was in housing for teaching animals (which has since been addressed) and funding to “write off” educational expenses for cases. Several of the facilities concerns that were identified have already been addressed (renovation of the Student Surgery Laboratory and Large Animal Holding, and renovation of AS/VM 104 into the Active Learning Classroom). The Pathology Demonstration Laboratory is the remaining area of concern, and initial discussions are occurring now to plan for future improvements to this area.

Additional assessments – Beginning with the inception of the North American Veterinary Educational Consortium (NAVMEC) we have periodically assessed how our DVM educational program measures up to the core competencies described in that report. We have presented these comparisons at faculty meetings and seminars and have been pleased to find that our curriculum already addressed the NAVMEC competencies quite well. We also used the NAVMEC roadmap in our curricular review process to ensure that the new curriculum would continue to align or to enhance alignment when appropriate.

11.2 Institutional outcomes

College evaluation – The College has a five-year strategic plan that was developed in 2008 for implementation in 2009. The plan was approved by the senior vice president of health sciences and provost. The plan was developed to be consistent with the strategic plans of the University and AHC. Each year, the College develops a “compact” that describes yearly plans and activities. Again, the plan must be consistent with those of the University and AHC. The dean has an advisory board that meets twice each year and provides feedback to the dean and College leadership. The VMC and VDL survey both clients and veterinarians.

The College benchmarks both financial and non-financial metrics with data in the AAVMC Comparative Data Report and with other schools and colleges at the University. The Administrative Council regularly reviews progress on the strategic plan to track progress on specific goals and strategies. Each project within the goals and strategies has assigned CVM leaders who are responsible for completion of specific projects within the plan.

Adequacy of resources and organizational structure – As noted previously, the College has leveraged VMC, VDL, TRC, and CAHFS revenue to enhance faculty numbers and the clinical teaching program. The expansion of all of these collegiate service units have increased the learning opportunities for students, and, at the same time, has placed additional pressure on the clinical teaching program through service demands. The collegiate administrative structure, with directors appointed to lead these service units separate from the academic departments, is essential to ensure the fiscal, operational, and fundraising expertise for the success of these business units of the CVM.

The CVM has been able to build up reserves and access central UMN funds to invest in improved teaching facilities and building security, as described elsewhere in this document. Without increases in tuition, these ongoing facility upgrades would not have been possible.

The College’s inclusion in the AHC is a positive for collegiate teaching programs. College students are able to use learning resources and technology developed and used by the other health science schools. The Interprofessional Education Resource Center (IERC), a facility used for evaluating students’ communication and interpersonal skills, is an example of how common learning space can be leveraged by all the health science schools. We use the IERC to conduct OSCEs with standardized clients to teach and assess students’ communication skills. In addition, the CVM’s inclusion in the AHC allows DVM students the opportunity to take part in interprofessional learning courses that include health professionals from eight other educational programs.

Other outcomes assessed – See section 10.3 for data on scholarly activity of faculty. In addition to traditional faculty scholarship in their disciplines, our faculty have embraced the newer discipline of scholarship of teaching and learning. A growing number of faculty are not only taking a scholarly approach to teaching, but also
publishing research findings in peer-reviewed journals. Evidence of the impact of this work is demonstrated by the fact that three of the 16 inductees into the AHC’s Academy of Excellence in the Scholarship of Teaching and Learning are faculty members from the CVM. This is the highest recognition of excellence in the educational mission of our AHC, and we are very proud that our faculty, though much smaller than the faculty of other colleges in the AHC, are so well-represented in this distinguished group, which was only established in 2008. Our faculty are also well-represented in the University-wide Academy of Distinguished Teachers. Recipients are chosen for excellence in instruction; involvement in students’ research, scholarship, and professional development; development of instructional programs; and advising and mentoring of students. In recent years, our nominees have been very successful in this highly competitive process. Faculty perceptions of teaching resources are described above. Student satisfaction is described above. Teaching improvement is assessed by the CCEP by “tagging” courses for which student overall ratings of the course fall greater than two standard deviations below the mean. These courses are reviewed on a more frequent basis and very often the course coordinators of these courses are assigned to work with our educational specialist for targeted improvements, often with dramatic and rapid results.

Use of outcomes findings for improvement of the educational program – The primary vehicle for use of outcomes findings to improve the DVM education program is the CCEP. The CCEP reviews numerous data sets and analyses including course evaluations, curriculum evaluations, Critical Incident Questionnaires, graduate surveys, employer focus group reports, Qualifying Exam scores (in the years we used the QE), and the comprehensive analysis looking at DVM student performance from the Class of 2004-2014 from undergraduate (admissions data) throughout the program (including GPA by semester, number of bad grades, clinical competency performance and NAVLE scores). This information has been used to inform decisions about numerous changes within the “current curriculum” (in place from 1997-2013). These ranged from splitting of “mega courses,” movement of courses within the curriculum, and track requirements changes, to changes within courses. Some recent examples include:

- Creation of a faculty “semester coordinator” to help coordinate laboratory assignments and exam dates
- Identification of several courses (identified by student evaluations as problematic) that have undergone significant changes, resulting in higher student ratings:
  - Toxicology (CVM 6195) – This course has undergone a change in course coordination, with changes to overall course structure, including increased clinical correlations, use of online tutorials, and use of altered assessment strategies to better meet student needs.
  - Radiology (CVM 6102) - Creation of more online learning resources for student practice, and increased opportunities for student engagement with cases in laboratories and class.
  - Parasitology (CVM 6202) - Increased student engagement and overall course structural alignment between course outcomes, classes, and laboratories.

As described under Standard 9, the Curriculum Review Board (CRB) also used these outcomes findings and more to inform their discussions and the resulting draft of the new curriculum that was approved by the faculty in 2013 for phased implementation. In addition to incremental curricular change and curriculum revision, outcomes findings have been used to guide decisions about facilities renovations such as the creation of the Pomeroy Student-Alumni Learning Center, the DEC, Large Animal Holding facility, and many other smaller projects.
University of Minnesota Organizational Chart

Board of Regents

University President
Eric W. Kaler, Ph.D.

Vice President for Health Sciences
Aaron Friedman

Academic Issues

Senior Vice President for Academic Affairs and Provost
Karen Hanson

Academic Programs/Services

School of Dentistry
Leon Assael, Dean†

School of Nursing
Connie Delaney, Dean†

College of Pharmacy
Marilyn Speedie, Dean†

School of Public Health
John Finnegan, Jr., Dean†

College of Veterinary Medicine
Trevor R. Ames, Dean†

AHC Centers & Institutes

Associate VP for Education
Barbara Brandt*

Associate VP for Research
Tucker LeBien*

Associate VP for Clinical and Translational Science
Bruce Blazar

Administrative Services

Associate VP & CFO
Beth Nunnally*

Associate VP
Chief of Staff
Terry Bock*

Senior Director of Communications and Public Affairs
Brian Lucas*

AHC Counsel
Keith Dunder*

Note: AHC Deans report to the Provost for academic issues, and up to the VP for Health Sciences for clinical, interdisciplinary, and administrative issues.

†AHC Deans Council
*AHC Operations Team

November 2012
AD HOC COMMITTEES

Curriculum Review Board
M. Conzemius, VCS
D. Feeney, VCS
D. Brown, VBS
J. Mickelson, VBS
E. Malone, VPM
J. Fetrow, VPM
M. Root Kustritz, Chair

Ex-officio: L. Molgaard

Government Relations
T. Ames, Dean (Chair)
J. Collins, VDL
L. Brickley, Communications
A. Beitz, VBS
G. Hugoson, CAHFS
T. Iverson, U Relations
A. Kircher, NCFPD
T. Molitor, VPM
S. Rao, Assoc Dean
C. Riggs, U Relations
J. Rohloff, President’s Office
B. Venn, Advancement
R. Washabau, VCS

Pet Policy
TBD, Graduate Student
G. Hansen, TRC
R. Merica, VBS
K. Janisch, VMC
C. Lim, VCS
M. Mackey, VDL
M. Ritt, VCS (Chair)
D. Obitz-Cooney, VMC
S. Pracht, CIC, Admin (Treasurer)
S. Crain, Resident/Interns
C. Ward, VPM
TBD, RAR

Students: A. Adrian ’13, L. Haverstock, ’14, T. Bierman ’15

Space Committee
L. Molgaard, Admin
S. Rao, Admin
L. Valeri, CAHFS
A. Beitz, VBS
R. Washabau, VCS
J. Collins, VDL
D. Lee, VMC
T. Molitor, VPM
T. Gordon, Facilities

Ex-officio: P. Buchner (Chair)

Student Promotions (4-yr staggered term)
T. Clarkson, VBS, 2015 (Chair)
R. Merica, VBS, 2016
D. Feeney, VCS, 2015
C. Lim, VCS, 2016
C. Ward, VPM, 2014
S. Madill, VPM, 2016

Students: Tammy Oseid, Susannah Lewis

Ex-officio: J. Maple, L. Molgaard, D. Wingert, E. Malone,
M. Root Kustritz, vice-chairs of all departments

Ex-officio: L. Molgaard, J. Maple
3yr Student: M. Miller

Summer Scholars Advisory
S. Sreevatsan, VPM
M. Rutherford, VBS
M. Murtaugh, VBS
B. Walcheck, VBS
F. Kassie, VCS - at large

APPOINTED COMMITTEES

Admissions (4-yr staggered term)
V. Cox, VBS, 2014
R. Merica, VBS, 2015
T. Fletcher, VBS, 2016
F. Williams, VBS, 2017
D. Lee, VCS, 2014
J. Overmann, VCS, 2015
M. Ritt, VCS, 2016 (Chair)
K. Stepaniuk, VCS 2017
E. Olson, VPM, 2014
P. Davies, VPM, 2015
M. Culhane, VPM, 2016
N. Robinson, VPM, 2017

Ex-officio: K. Nelson, L. Molgaard

Awards, Honors & Scholarship (2-yr staggered term)
M. Rutherford, VBS, 2014
A. Larson, VBS, 2015
S. Lowum, VCS, 2014
C. Ober, VCS 2015
K. Pelican, VPM, 2014
U. Sorge, VPM, 2015

Ex-officio: K. Hanson, B. Venn

Committee on Curriculum
& Educational Policy (4-yr staggered term)
J. Collister, VBS, 2015 (Chair)
T. Clarkson, VBS, 2016
D. Feeney, VCS, 2015
C. Lim, VCS, 2016
C. Ward, VPM, 2014
S. Madill, VPM, 2016

Students: Tammy Oseid, Susannah Lewis

Ex-officio: J. Maple, L. Molgaard, D. Wingert, E. Malone,
M. Root Kustritz, vice-chairs of all departments

Ex-officio: L. Molgaard, J. Maple
3yr Student: M. Miller

Student Academic Grievance Committee (As Needed)
Faculty
Faculty
P&A
Grad student
Grievance officer

Students: TBD

Ex-officio: TBD

Students: TBD

Ex-officio: TBD
CVM COMMITTEES

Administrative Council
  T. Ames, Dean
  P. Buchner, Chief Operating/Financial Officer
  J. Collins, Director, VDL
  A. Beitz, Chair, VBS
  L. Larson, Director, Human Resources
  D. Lee, Hospital Director, VMC
  L. Molgaard, Assoc Dean, Acad & Student Affairs
  T. Molitor, Chair, VPM
  J. Ponder, Executive Director, Raptor Center
  S. Rao, Assoc Dean, Research
  M. Rutherford, Assoc Dean, Graduate Programs
  R. Washabau, Chair, VCS
  S. Wells, Co-Director, CAHFS

Health & Safety
  T. Gordon, Facilities
  L. Hiber, VMC
  J. Maple, ASA
  J. Danzeisen, VBS
  S. Erickson, Facilities
  R. Joki, VDL
  C. Knutson, VCS
  T. Bakken, VPM/VCS
  TBD, TRC
  P. Buchner, Chief Operating/Financial Officer (Chair)
  Ex-officio: L. Larson

Museum
  L. Berg
  T. Fletcher
  C. Jessen
  P. Maraveias (Curator)
  R. Olson
  P. Poss (President)
  D. Sime (Vice President)
  D. Sorenson (Curator)

Class Representatives
  '17 – J. Dean, P. Zentner
  '16 – J. Drayton, A. Hall
  '15 – A. Kryzer, A. Roland
  '14 – K. Vickerman, E. MacKinnon

SCAVMA Advisors
  M. Root Kustritz
  R. Porter

Student Council Advisors
  A. Anderson
  L. Molgaard
ELECTED COMMITTEES

Collegiate Promotion and Tenure (3-year term effective 11/09)
- C. Cardona, VBS (2014)
- D. Isaacson, VBS (2016)
- M. Conzemius, VCS (2016)
- J. Lulich, VCS (2014)
- S. Wells, VPM (2014)
- S. Goyal, VPM (2016)
- K. Nagaraja, Faculty Council (2014)

Faculty Council (3-year term)
- M. Kannan, VBS (2015)
- K. Nagaraja, VBS (2014)
- J. Lulich, VCS (2015)
- J. Armstrong, VCS (2014)
- C. Ward, VPM (2015)
- S. Goyal, VPM (2014)
- S. Koch - at-large (2014) (Chair)
- R. Singer - at-large (2015)
- B. Walcheck – at-large (2016)
  Alternates: B. Stromberg, VBS (2015)
  S. Torres, VCS (2014)
  D. Patnayak, VPM (2013)

Ex-officio: T. Ames, Dean

Faculty Secretary (2-year term)
- T. Fletcher (2014)

Research Committee
Tenured Faculty (3-year staggered terms)
- H. Ly, VBS (2015) (Chair)
- T. Johnson, VBS (2016)
- D. Isaacson, VBS (2014)
- M. Conzemius, VCS (2014)
- J. Modiano, VCS (2015)
- L. Sharkey, VCS (2016)
- T. O’Brien, VPM (2014)
- S. Sreevatsan, VPM (2016)
- S. Valberg, VPM (2015)

Non-tenured Faculty (1-yr term)
- M. Cheeran, VPM (2014)
- E. Dickerson, VCS (2014)

Ex-officio: S. Rao

University Senate Members (3-year term)
- R. Davies (2014)
- B. Stromberg (2014)
- L. Pluhar (2015)
- H. Ly (2016)
  Alternate: D. Polzin (2016)

OTHER COMMITTEES
AHC Finance & Planning Committee
D. Lee

AHC Clinical Research Steering Committee
E. Pluhar

AHC Faculty Consultative Committee
N. Patterson, 2013/14

AHC P&T Committee
D. Brown

University Biomedical Grant Nominations Committee
A. Beitz

University Biomedical Research Advisory Committee
D. Brown

University Institutional Animal Care and Use
C. Adams
J. Armstrong
A. Beitz
A. Goplen
S. Madill
L. Vulcanova-Hart

University Institutional Biosafety
D. Brown (Chair)

University Institutional Conflict Review Committee
D. Feeney (Chair)

University Radiation Protection Advisory Committee
Alternate: T. O’Brien

University Research Committee
H. Ly, 2015

University Research and Scholarship Advisory Panel
S. Kennedy

University Retirement Subcommittee
D. Feeney (Chair), 2015

University Senate Council of Academic Professionals & Administrators (3-year term)
C. Elzinga, 2014
Alternate: A. Fahrenkrug

University Service Improvement Liaison Group
P. Berzins
### TOTAL EXPENDITURES FOR IMMEDIATE PAST 5 FISCAL YEARS
Direct and Indirect Expenses ($ in thousands)

<table>
<thead>
<tr>
<th>Yr.</th>
<th>Instruction</th>
<th>Academic Support</th>
<th>Student Services</th>
<th>Services of Educational Activity</th>
<th>Un-Sponsored Student Aid</th>
<th>Sponsored Student Aid</th>
<th>Other Sponsored Activity</th>
<th>Ext &amp; Public Service</th>
<th>Total Expenses (Direct &amp; Indirect)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Teaching Hospital</td>
<td>Diagnostic Lab</td>
<td>Other</td>
<td>Amount</td>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>14,940</td>
<td>5,326</td>
<td>1,117</td>
<td>25,426</td>
<td>12,127</td>
<td>292</td>
<td>20,050</td>
<td>8,827</td>
<td>5,200</td>
</tr>
<tr>
<td>2010</td>
<td>13,449</td>
<td>5,794</td>
<td>1,106</td>
<td>25,254</td>
<td>11,657</td>
<td>303</td>
<td>23,225</td>
<td>11,278</td>
<td>5,092</td>
</tr>
<tr>
<td>2011</td>
<td>13,467</td>
<td>6,015</td>
<td>1,160</td>
<td>25,067</td>
<td>12,317</td>
<td>300</td>
<td>24,704</td>
<td>16,306</td>
<td>4,409</td>
</tr>
<tr>
<td>Restated 2012</td>
<td>13,783</td>
<td>5,603</td>
<td>1,168</td>
<td>25,201</td>
<td>12,724</td>
<td>405</td>
<td>19,217</td>
<td>17,624</td>
<td>4,731</td>
</tr>
<tr>
<td>Restated 2013</td>
<td>15,014</td>
<td>5,749</td>
<td>1,160</td>
<td>24,947</td>
<td>13,495</td>
<td>582</td>
<td>19,995</td>
<td>16,986</td>
<td>5,752</td>
</tr>
<tr>
<td>% change from FY09</td>
<td>0.5%</td>
<td>7.9%</td>
<td>3.8%</td>
<td>-1.9%</td>
<td>11.3%</td>
<td>99.3%</td>
<td>-0.3%</td>
<td>92.4%</td>
<td>10.6%</td>
</tr>
<tr>
<td>Reported 2012</td>
<td>10,846</td>
<td>5,603</td>
<td>1,169</td>
<td>25,201</td>
<td>12,724</td>
<td>405</td>
<td>19,217</td>
<td>19,771</td>
<td>5,520</td>
</tr>
<tr>
<td>Reported 2013</td>
<td>9,285</td>
<td>5,749</td>
<td>1,160</td>
<td>24,947</td>
<td>13,495</td>
<td>582</td>
<td>19,995</td>
<td>21,004</td>
<td>7,463</td>
</tr>
<tr>
<td>% Change from FY09</td>
<td>-37.8%</td>
<td>7.9%</td>
<td>3.8%</td>
<td>-1.9%</td>
<td>11.3%</td>
<td>99.3%</td>
<td>-0.3%</td>
<td>138.0%</td>
<td>43.5%</td>
</tr>
</tbody>
</table>

Note: For trend comparison, FY2012 and FY2013 have been restated for previous reporting practice of faculty salaries. Instruction function category has been increased, with corresponding decreases to Other Sponsored Activity and Extension and Public Service categories.

### COLLEGE REVENUE
(SOURCES OF FUNDS)
FROM ALL SOURCES FOR IMMEDIATE PAST 5 FISCAL YEARS

<table>
<thead>
<tr>
<th>Yr.</th>
<th>State Appropriations</th>
<th>Benefits</th>
<th>Tuition &amp; Fees</th>
<th>Is tuition estimated amount?</th>
<th>Endowment Income (current yr.)</th>
<th>Gifts for Current Use</th>
<th>Sponsored Program Income/Cost Recovery</th>
<th>Other</th>
<th>SALES and SERVICES</th>
<th>SALES and SERVICES</th>
<th>Reserves and Transfers</th>
<th>TOTAL REVENUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Teaching Hospital</td>
<td>Diagnostic Lab</td>
<td>Other Sources from Sales &amp; Services</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>23,087</td>
<td>12,823</td>
<td>N</td>
<td>895</td>
<td>4,099</td>
<td>19,586</td>
<td>18,271</td>
<td>9,054</td>
<td>2,206</td>
<td>2,428</td>
<td>$92,449</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>21,603</td>
<td>13,435</td>
<td>N</td>
<td>877</td>
<td>3,873</td>
<td>27,241</td>
<td>17,678</td>
<td>8,705</td>
<td>2,485</td>
<td>2,302</td>
<td>$98,199</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>21,008</td>
<td>15,024</td>
<td>N</td>
<td>1,023</td>
<td>3,555</td>
<td>32,546</td>
<td>17,954</td>
<td>8,895</td>
<td>3,413</td>
<td>3,351</td>
<td>$106,769</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>19,505</td>
<td>16,185</td>
<td>N</td>
<td>1,112</td>
<td>3,368</td>
<td>29,693</td>
<td>18,357</td>
<td>9,619</td>
<td>3,558</td>
<td>3,139</td>
<td>$104,536</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>20,908</td>
<td>17,495</td>
<td>N</td>
<td>907</td>
<td>3,880</td>
<td>26,915</td>
<td>18,053</td>
<td>9,974</td>
<td>3,424</td>
<td>2,711</td>
<td>$104,267</td>
<td></td>
</tr>
<tr>
<td>% Change from FY09</td>
<td>-9.4%</td>
<td>36.4%</td>
<td>1.3%</td>
<td>-5.3%</td>
<td>37.4%</td>
<td>-1.2%</td>
<td>10.2%</td>
<td>55.2%</td>
<td>11.6%</td>
<td>12.8%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chart C
CVM Financial Trends
Non-sponsored Accounts

Dollars in Thousands

- State Funds
- Tuition with Rate Increases
- Tuition with Rate and Enrollment Increases
- Other Revenues
- Operating Expenses

FY08 FY09 FY10 FY11 FY12 FY13
Chart D
Professional Program Expenditures by Funding Source
Including Instruction, Student Services, Sponsored Student Aid, and VTH
(FY12/13 Adjusted for Consistent Reporting)
### Chart E

**VMC Generated Income as a % of Expenditures**  
(Income excluding Tuition and State Funding)

<table>
<thead>
<tr>
<th></th>
<th>FY09</th>
<th>FY10</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>19184</td>
<td>20061</td>
<td>19096</td>
<td>19793</td>
<td>19246</td>
</tr>
<tr>
<td>Total Expenditures</td>
<td>24500</td>
<td>26072</td>
<td>24332</td>
<td>25149</td>
<td>25040</td>
</tr>
<tr>
<td>Income as % of Expenditures</td>
<td>78%</td>
<td>77%</td>
<td>78%</td>
<td>79%</td>
<td>77%</td>
</tr>
</tbody>
</table>

*Note: The chart shows the generated income and total expenditures for the years FY09 to FY13, along with the income as a percentage of expenditures. The income excludes tuition and state funding.*
<table>
<thead>
<tr>
<th>Facility</th>
<th>Location</th>
<th>Miles</th>
<th>Driving Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy Education Center</td>
<td>New Sweden, MN</td>
<td>80</td>
<td>1 ½ hour</td>
</tr>
<tr>
<td>Transition Management Facility</td>
<td>Baldwin, WI</td>
<td>50</td>
<td>1 hour</td>
</tr>
<tr>
<td>West Metro Equine Practice</td>
<td>Maple Plain, MN</td>
<td>28</td>
<td>45 minutes</td>
</tr>
<tr>
<td>Animal Humane Society</td>
<td>Golden Valley, MN</td>
<td>12</td>
<td>20 minutes</td>
</tr>
<tr>
<td>R&amp;D Systems Farm</td>
<td>Cannon Falls, MN</td>
<td>50</td>
<td>55 minutes</td>
</tr>
</tbody>
</table>
Recent improvements to facilities

Classrooms/Seminar Rooms/Teaching Labs/Student Spaces

- Renovation of Ben Pomeroy Student-Alumni Learning Center - 9000 sq ft (2006/07 - $5.5M)
- Changes for expanded first-year class size to AS/VM 125 classroom and 104 teaching lab (2009)
- Construction of 15,000 sq ft facility on the Davis Family dairy farm in New Sweden, MN (2009 - $2.2M)
- Upgrade of student computer lab for furnishings, projectors, and clinical pathology teaching needs (2010)
- Installation of Mediasite lecture capture systems in AS/VM 125, 135, and Pomeroy 215 (2010/11 – $57K)
- Upgrade of audio system and addition of 12 flat-screen monitors in microanatomy teaching lab AS/VM 104 (2011)
- Improvements made to temperature controls in classrooms AS/VM 125, 135, and Pomeroy 213, 215 (2011)
- Installation of card-swipe reader to AS/VM for improved student after hour access (2011)
- Conversion of unused faculty offices/lab space to Graduate Student Commons (2010)
- Improvements to furnishings of conference room, including addition of teleconference equipment and large display monitor for presentations (2011-12)
- Addition of power door operators in AS/VM (2012)
- Upgrade to drainage, flooring, sinks, lighting, HVAC, and demonstration boxes in obstetrics teaching lab (2012)
- Improved heating controls in Pomeroy seminar room and Academic & Student Affairs offices (2013)
- Improvements to Equine Center paddocks and theriogenology teaching spaces to accommodate move of the teaching horses from the Large Animal Holding facility (2013)
- Conversion of nine restrooms in various buildings to undesignated gender facilities to meet requests by students and others (2013)
- Repair to Pomeroy external masonry (2013)
- Upgrades to seating and worktops in AS/VM 135 (2012)
- New projector screens installed in AS/VM 125, 135 (2012)
- Expansion of capacity to 105 students and upgraded chairs, improved wireless and electrical systems in Vet Science 145 (2013)
- Addition of white boards, improvements to instructor sight lines in AS/VM 135 (2013)
- Renovation of AS/VM 104 teaching lab to create the Active Learning Classroom (2013 - $800K)
- Renovation of VMC/South 254 Surgery and Clinical Skills teaching laboratory (2013 - $850K)
- Replacement of Anatomy teaching laboratory flooring (2013)
- Improvements to 255B VMC/N and relocation of SCAVMA Pet Food Distribution Center (2013)
- Upgrade of AS/VM 335K/385J conference rooms with window coverings and furnishings (2013)

Service Facilities

- Construction of Equine Center for teaching, research, and service – 60,000 sq ft (2006/07)
- Addition of 3700 sq ft biosafety level 3 (BSL-3) necropsy lab in VDL (2007); addition of effluent decontamination system (2009)
- Renovation of 2921 sq ft VMC Hematology lab (2008)
- Renovation of 2733 sq ft Large Animal Wards and installation of 3T MRI (2008)
- Renovation of 1600 sq ft and installation of a Linear Accelerator service area (2008)
- Renovation of 1132 sq ft for oncology treatment (2010)
- Construction of 3640 sq ft 14-stall overflow barn at Equine Center (2011)
- Renovation of 748 sq ft and installation of CT scanner (2011)
- Upgrade of VMC Pharmacy ducted hood for improved safety of chemotherapeutic drug preparation (2011)
- Relocation of VDL Mastitis lab (media) to underutilized Microbiology teaching prep area (2013)
Research Laboratories

- Remodeled 758 sq ft for microbiology research (2008)
- Remodeled 1689 sq ft for immunology research (2008)
- Remodeled 1032 sq ft of RAR animal housing facilities (2010)
- Remodeled 1165 sq ft BSL2+ sample archive lab (2010)
- Remodeled 2134 sq ft for avian virology research (2010)
- Remodeled 784 sq ft for immunology research (2011)
- Remodeled 1134 sq ft for cell and protein analysis research (2011)
- Remodeled 1032 sq ft for infectious disease research (2011)
- Remodeled 267 sq ft for wild bird virus surveillance research (2011)
- Addition of additional security in AS/VM first floor research corridor (2012)
- Remodeled 428 sq ft for equine genetics research (2013)
- Remodeled 409 sq ft for aquatic research (2013)

Office Environment

- Converted 854 sq ft unused graphics design area into graduate student spaces with new furnishings (2008)
- Converted 1074 sq ft unused (after construction of Pomeroy Center) student lounge into office space (2008)
- Converted unused faculty offices to 12 graduate student spaces (2011)

Other

- Installation of fire suppression infrastructure and fire detection system in AS/VM and VMC/North buildings (2010)
- Replacement of AS/VM stair tower masonry (2009)
- VDL, TRC HVAC systems converted to chilled water system (2009)
- Veterinary Anatomy building, not used for many years, was demolished (2011)
- Upgrade to wireless infrastructure in VMC North and South, Equine Center (2011/12)
- Security cameras installed in Small Animal Hospital lobby and Equine Center (2011)
- Security cameras installed in Large Animal Hospital lobby and TRC (2012)
- VDL access security upgrade (2013)
- Security cameras installed in CVM library, VMC/North entrance, LAH external entrance (2013)
### Table A1. Number of VMC Accessions

<table>
<thead>
<tr>
<th>Species</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>5-year % Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bovine</td>
<td>119</td>
<td>92</td>
<td>127</td>
<td>130</td>
<td>80</td>
<td>-34%</td>
</tr>
<tr>
<td>Camelid</td>
<td>157</td>
<td>139</td>
<td>160</td>
<td>147</td>
<td>160</td>
<td>2%</td>
</tr>
<tr>
<td>Canine</td>
<td>26720</td>
<td>26711</td>
<td>25348</td>
<td>25597</td>
<td>25512</td>
<td>-5%</td>
</tr>
<tr>
<td>Caprine</td>
<td>67</td>
<td>73</td>
<td>24</td>
<td>86</td>
<td>108</td>
<td>61%</td>
</tr>
<tr>
<td>Equine</td>
<td>1675</td>
<td>1719</td>
<td>1531</td>
<td>1561</td>
<td>1362</td>
<td>-19%</td>
</tr>
<tr>
<td>Feline</td>
<td>5755</td>
<td>5369</td>
<td>5345</td>
<td>5072</td>
<td>4864</td>
<td>-15%</td>
</tr>
<tr>
<td>Ovine</td>
<td>116</td>
<td>30</td>
<td>45</td>
<td>31</td>
<td>55</td>
<td>-53%</td>
</tr>
<tr>
<td>Porcine</td>
<td>20</td>
<td>27</td>
<td>27</td>
<td>35</td>
<td>68</td>
<td>240%</td>
</tr>
<tr>
<td>Caged Pet Birds</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Caged Pet Mammals</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Avian Wildlife (Raptors)</td>
<td>633</td>
<td>702</td>
<td>699</td>
<td>786</td>
<td>914</td>
<td>44%</td>
</tr>
<tr>
<td>Zoo/Non-domestic</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

### Table A2. Number of Hospitalized Cases

<table>
<thead>
<tr>
<th>Species</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>5-year % Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bovine</td>
<td>79</td>
<td>42</td>
<td>32</td>
<td>41</td>
<td>39</td>
<td>-51%</td>
</tr>
<tr>
<td>Camelid</td>
<td>72</td>
<td>50</td>
<td>50</td>
<td>67</td>
<td>63</td>
<td>-13%</td>
</tr>
<tr>
<td>Canine</td>
<td>6898</td>
<td>5649</td>
<td>4528</td>
<td>4614</td>
<td>4658</td>
<td>-32%</td>
</tr>
<tr>
<td>Caprine</td>
<td>25</td>
<td>35</td>
<td>18</td>
<td>29</td>
<td>61</td>
<td>144%</td>
</tr>
<tr>
<td>Equine</td>
<td>927</td>
<td>873</td>
<td>587</td>
<td>806</td>
<td>654</td>
<td>-29%</td>
</tr>
<tr>
<td>Feline</td>
<td>1581</td>
<td>1193</td>
<td>1076</td>
<td>1012</td>
<td>965</td>
<td>-39%</td>
</tr>
<tr>
<td>Ovine</td>
<td>13</td>
<td>8</td>
<td>3</td>
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</tr>
<tr>
<td>Porcine</td>
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<tr>
<td>Caged Pet Birds</td>
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<td>NA</td>
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<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
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<td>Avian Wildlife (Raptors)</td>
<td>411</td>
<td>444</td>
<td>433</td>
<td>485</td>
<td>555*</td>
<td>135%</td>
</tr>
<tr>
<td>Zoo/Non-domestic</td>
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<td>NA</td>
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* Raptor Center data for 2013 is as of early December.
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<th>Species</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<tbody>
<tr>
<td>Bovine</td>
<td>301</td>
<td>130</td>
<td>135</td>
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<td>Camelid</td>
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<td>156</td>
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<td>5649</td>
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<td>4614</td>
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<td>Caprine</td>
<td>70</td>
<td>113</td>
<td>38</td>
<td>94</td>
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<td>5782</td>
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<td>20,822 individual cows seen</td>
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<td>178,150 cows included in herd assessments</td>
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<tr>
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<td>99 visits for individual cow dx/tx 84 visits for herd assessments</td>
<td>20,822 individual cows seen 178,150 cows included in herd assessments</td>
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<td><strong>Caprine</strong></td>
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### Herd/Flock Health Program

<table>
<thead>
<tr>
<th>Animal Species</th>
<th>Describe your clinical resources for production medicine training by production group below</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy</td>
<td>Dairy Education Center in New Sweden, MN; Davis Family Farm (3,000+ lactating cow farms and a transitional facility calving out up to 12,000 cows/year)</td>
</tr>
<tr>
<td>Beef Feedlots</td>
<td>Privately owned producer farms,</td>
</tr>
<tr>
<td>Cow-Calf</td>
<td>Privately owned producer farms,</td>
</tr>
<tr>
<td>Small Ruminants</td>
<td>Antibody producing herd (600 sheep &amp; goats), producer farms</td>
</tr>
<tr>
<td>Swine</td>
<td>800 sow farrow to finish herd (Waseca); 60 sow alternative system (Morris)</td>
</tr>
<tr>
<td>Poultry</td>
<td>University of Minnesota AS Poultry Barns, Willmar poultry, Jennie-O</td>
</tr>
<tr>
<td>Fish</td>
<td>Sea Life Minnesota, Como Zoo, Minnesota Zoo, private aquaculture farms</td>
</tr>
<tr>
<td>Equine</td>
<td>Privately owned stables</td>
</tr>
<tr>
<td>Other Camelid</td>
<td>Alpaca Expo, UMN Camelid Health Conference, private farms</td>
</tr>
</tbody>
</table>
### Table D

<table>
<thead>
<tr>
<th>HOSPITAL</th>
<th>LEARNING ROTATION (DURATION)</th>
<th>SURGICAL AND MEDICAL FACILITIES</th>
<th>NECROPSY</th>
<th>IMAGING</th>
<th>DIAGNOSTIC SUPPORT SERVICES</th>
<th>ISOLATION</th>
<th>INTENSIVE OR CRITICAL CARE</th>
<th>REFERENCE MATERIALS</th>
<th>MEDICAL RECORDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy Education Center (DEC)</td>
<td>Variable; up to 8 weeks for students tracking dairy</td>
<td>Field surgery facilities</td>
<td>Field</td>
<td>NA</td>
<td>In-house laboratory, UMN VDL</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
<td>Dairy COMP</td>
</tr>
<tr>
<td>R&amp;D Systems</td>
<td>1-2 days/rotation, 6 rotations/yr</td>
<td>Field, surgical suite</td>
<td>Field</td>
<td>NA</td>
<td>UMN VDL; Marshfield Laboratories</td>
<td>NA</td>
<td>Hospital room, on-site staff</td>
<td>Yes</td>
<td>In-house records system</td>
</tr>
<tr>
<td>West Metro Equine Practice</td>
<td>15-18 2-week rotations</td>
<td>Ambulatory only</td>
<td>NA</td>
<td>DR, ultrasound, endoscopy</td>
<td>UMN VDL; Marshfield Laboratories</td>
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<td>NA</td>
<td>Yes</td>
<td>UVIS</td>
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<td>Golden Valley Animal Humane Society</td>
<td>Projected at least 13 rotations/yr</td>
<td>Surgical suite, medical facilities available</td>
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<td>NA</td>
<td>In-house laboratory</td>
<td>NA</td>
<td>NA</td>
<td>Yes</td>
<td>In-house records system</td>
</tr>
</tbody>
</table>

These clinical sites are not distributed sites. They are off-campus facilities staffed by faculty members from the college who provide all oversight for students. All experiences at these facilities are part of a specific rotation and all student assessments are completed by appropriate faculty members.
### A. Veterinary Medical Program

<table>
<thead>
<tr>
<th>Class</th>
<th>Year 2013</th>
<th>Year 2012</th>
<th>Year 2011</th>
<th>Year 2010</th>
<th>Year 2009</th>
</tr>
</thead>
<tbody>
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<td>First-year</td>
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<td>100</td>
<td>101</td>
<td>100</td>
<td>97</td>
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<td>Second-year</td>
<td>98</td>
<td>103</td>
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<tr>
<td>Third-year</td>
<td>102</td>
<td>96</td>
<td>98</td>
<td>89</td>
<td>90</td>
</tr>
<tr>
<td>Fourth-year</td>
<td>96</td>
<td>98</td>
<td>90</td>
<td>90</td>
<td>83</td>
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<tr>
<td># Graduated</td>
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<td>90</td>
<td>89</td>
<td>81</td>
<td>87</td>
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</table>

### Table B

#### 2008-2009

<table>
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<tr>
<th>Department</th>
<th># Interns</th>
<th># Residents</th>
<th># Resident-MS</th>
<th># Resident-PhD</th>
<th>MS</th>
<th>PhD</th>
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</table>

#### 2009-2010

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#### 2010-2011

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#### 2011-2012

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#### 2012-2013

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C. DVM Students per year for last five years

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<th>DVM</th>
<th>*Min</th>
<th>% Min</th>
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* Min = minority students, as used in the AAVMC Comparative Data Report

D. Other educational programs

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<th>Year</th>
<th>ACTIVITIES</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Additional Clinical Year Students* Number enrolled</td>
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<tr>
<td>2013</td>
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<td>2012</td>
<td>22</td>
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<tr>
<td>2011</td>
<td>25</td>
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<tr>
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<td>10</td>
</tr>
<tr>
<td>2009</td>
<td>12</td>
</tr>
</tbody>
</table>

* represents students or students admitted for only the clinical year from other accredited and nonaccredited schools
Table A – Loss and recruitment of faculty (both tenure-track & clinical track/equivalent)  
Provide data for past five years (FY 09-13: covering July 1, 2008 - June 30, 2013).

<table>
<thead>
<tr>
<th>Dept</th>
<th>Faculty lost, number</th>
<th>Discipline/Specialty (Lost)</th>
<th>Recruited, number</th>
<th>Discipline/Specialty (Recruited)</th>
<th>Year</th>
</tr>
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<tbody>
<tr>
<td>VBS</td>
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<td>Microbiology</td>
<td></td>
<td></td>
<td>FY 2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MolecularVirology/ Poultry</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>VBS</td>
<td>1</td>
<td>Microbiology</td>
<td>2</td>
<td>Infectious Disease/Poultry</td>
<td>FY 2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Infectious Disease/Poultry</td>
<td></td>
</tr>
<tr>
<td>VBS</td>
<td></td>
<td>1</td>
<td></td>
<td>Immunology</td>
<td>FY 2011</td>
</tr>
<tr>
<td>VBS</td>
<td></td>
<td>2</td>
<td></td>
<td>Infectious Disease</td>
<td>FY 2012</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Infectious Disease</td>
<td></td>
</tr>
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<td>0</td>
<td></td>
<td>FY 2013</td>
</tr>
<tr>
<td>VCS</td>
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<td>Private Practice Prep</td>
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<td>FY 2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Emergency/Critical Care</td>
<td></td>
<td>Clinical Pathology</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Medical Imaging</td>
<td></td>
<td>General Practice</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td>SA Emergency/Critical Care</td>
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<td></td>
<td>SA Internal Medicine</td>
<td></td>
<td>SA Oncology</td>
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</tr>
<tr>
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<td>3</td>
<td>Medical Imaging</td>
<td>FY 2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SA Surgery</td>
<td></td>
<td>Dentistry</td>
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<td></td>
<td>Ophthalmology</td>
<td></td>
<td>Oncology</td>
<td></td>
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<td>2</td>
<td>Ophthalmology</td>
<td>FY 2011</td>
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<td></td>
<td></td>
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<td></td>
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<td></td>
<td>Ophthalmology</td>
<td></td>
<td></td>
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<tr>
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<td></td>
<td>Anesthesia</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
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<td>FY 2012</td>
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<td>Pathology</td>
<td></td>
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</tr>
<tr>
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<td>Dairy</td>
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<tr>
<td></td>
<td>LA Ambulatory Pathology</td>
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</tr>
<tr>
<td>8</td>
<td>LA Internal Medicine</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Beef Production/Med Veterinary Public Health</td>
<td></td>
<td></td>
<td></td>
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</tr>
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<td>Equine Rehab/Camelid Dairy</td>
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<td>Swine Ecosystem Health</td>
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<table>
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<th>Pathology</th>
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<tr>
<td></td>
<td>Toxicology Pathology</td>
</tr>
<tr>
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<td>Ecosystem Health Veterinary Public Health</td>
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<table>
<thead>
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<tr>
<td></td>
<td>Veterinary Public Health</td>
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<tr>
<td></td>
<td>Molecular Diagn/Swine</td>
</tr>
<tr>
<td>2</td>
<td>Dairy Production Med Equine ambulatory</td>
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<table>
<thead>
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<th>Pathology</th>
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<tbody>
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<td>2</td>
<td>Swine Disease Pathology</td>
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<tr>
<td>9</td>
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<td></td>
<td>Pathology Equine Surgery</td>
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<td>Equine Surgery Aquaculture</td>
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<table>
<thead>
<tr>
<th>VPM</th>
<th>Pathology</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
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<th>Other</th>
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<td>TOTAL</td>
<td>6.02</td>
<td>29.60</td>
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Table C – Nonveterinarians (Data as of December 2013)

<table>
<thead>
<tr>
<th>Title</th>
<th>MS</th>
<th>PhD</th>
<th>Board Certified</th>
<th>Board Certified &amp; MS</th>
<th>Board Certified &amp; PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
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<td>0</td>
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</tr>
<tr>
<td>Professor*</td>
<td>0</td>
<td>11</td>
<td>0</td>
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<tr>
<td>Associate Professor*</td>
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<tr>
<td>Instructor</td>
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</table>

Part-Time Faculty (<75%)

*includes clinical track

Table D – Veterinarians (Data as of December 2013)

<table>
<thead>
<tr>
<th>Title</th>
<th>DVM (only)</th>
<th>MS</th>
<th>PhD</th>
<th>Board Certified</th>
<th>Board Certified &amp; MS</th>
<th>Board Certified &amp; PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Professor*</td>
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<td>16</td>
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<tr>
<td>Associate Professor*</td>
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<td>2</td>
<td>10</td>
<td>7</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Assistant Professor*</td>
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<td>3</td>
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<td>0</td>
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</tr>
<tr>
<td>Lecturer</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Part-Time Faculty (<75%)

*includes clinical track
| Year 1 fall |
|------------------|------------------|
| Gopher Orientation and Leadership Experience (GOALE) |
| Foundations of Interprofessional Communication and Collaboration (FIPCC) |
| Professional Development I |
| Overview of Animal Populations |
| Anatomy |
| Normal Radiographic Anatomy |
| Veterinary Physiological Chemistry |
| Histology |
| Principles of Veterinary Nutrition |
| Clinical Skills I |

| Year 1 spring |
|------------------|------------------|
| Critical Scientific Reading |
| Professional Development II |
| Organology |
| Veterinary Neurobiology |
| Veterinary Physiology |
| Veterinary Pharmacology |
| Host Defenses |
| Infectious Agents: Virology |
| Applied Veterinary Genetics |
| Basic Pathology |
| Clinical Skills II |
| Behavior Core |

| Year 2 fall |
|------------------|------------------|
| Professional Development III |
| Infectious Agents: Parasitology |
| Infectious Agents: Pharmacology |
| Systemic Pathology |
| Swine Core |
| Neuropharmacology |
| Reproductive biology |
| Infectious agents: Bacteriology |
| Clinical Epidemiology |
| Clinical Skills III |
| Skin and Adnexa |

| Year 2 spring |
|------------------|------------------|
| Professional Development III |
| Infectious Agents: Parasitology |
| Infectious Agents: Pharmacology |
| Systemic Pathology |
| Swine Core |

| Year 3 fall |
|------------------|------------------|
| Neuropharmacology |
| Reproductive Biology |
| Infectious Agents: Bacteriology |
| Clinical Epidemiology |
| Clinical Skills III |
| Skin and Adnexa |

| Year 3 spring |
|------------------|------------------|
| Large Animal Hospital Practicum |
| Veterinary Imaging II |
| Clinical Skills V |
| Small Animal Gastroenterology |
| Metabolic Disorders |
| Small Animal Infectious Diseases |
| Hematoimmunologic Disorders |
| Reproductive Tract Disease (By Species) and Lab |
| Small Animal Hospital Practicum |
| Large Animal Digestive Disorders |
| Musculoskeletal System Disorders |
| Oncology |
| Large Animal Infectious Diseases |
| Reproductive Tract Diagnostic Techniques |

<table>
<thead>
<tr>
<th>ELECTIVES (12 credit min, some required by track)</th>
</tr>
</thead>
</table>
# CORE COURSES NEW CURRICULUM (graduating class 2017)

## Year 1 fall

- **Anatomy I**
- **Clinical Skills I**
- **Microscopic Anatomy**
- **Veterinary Biochemistry, Nutrition, and Genetics**
- **Physiology I**
- **Professional Development I**
- **GOALE**
- **FIPCC**

## Year 1 spring

- **Anatomy II**
- **Clinical Skills II**
- **Physiology II**
- **Professional Development II**
- **GOALE**
- **Critical Scientific Reading**
- **Immunology**
- **Basic Pathology**
- **Agents of Disease I**
- **Preventive Medicine**

## Year 2 fall

- **Agents of Disease II**
- **Pharmacology I**
- **Systemic Pathology**
- **Clinical Pathology I**
- **Clinical Skills III**
- **Clinical Epidemiology**
- **Public Health**
- **Small Animal Medicine I**
- **Diagnostics Laboratory**

## Year 2 spring

- **Small Animal Medicine II**
- **Small Animal Surgery I**
- **Large Animal Medicine I**
- **Large Animal Surgery I**
- **Veterinary Imaging I**
- **Clinical Pathology II**
- **Clinical Skills IV**
- **Pharmacology II**
- **Professional Development III**
- **Non-traditional Pets**
- **Avian Core**

## Year 3 fall

- **Small Animal Medicine III**
- **Small Animal Surgery II and Anesthesia**
- **Large Animal Medicine II**
- **Large Animal Surgery II**
- **Veterinary Imaging II**
- **Comparative Specialties**
- **Comparative Theriogenology**
- **Clinical Skills V**
- **Professional Development IV**

## Year 3 spring

- **Equine track – Orientation to Clinics – Equine I – Equine II – Equine Problems – 12 credits minimum**
- **Mixed track – Orientation to Clinics – Equine I – Food Animal I – Small Animal I – Obstetrics laboratory – 12 credits minimum**
### Rotation Requirements by Track

<table>
<thead>
<tr>
<th>SMALL ANIMAL</th>
<th>FOOD ANIMAL</th>
<th>EQUINE</th>
<th>MIXED ANIMAL</th>
<th>RESEARCH/PUBLIC HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
</tr>
<tr>
<td>4 SAM (1 SAM-A + 3 SAM-B)</td>
<td>1 LAM + 3 LAM or DOFC or SwPPDxT or Camelid or Feedlot or SmRum or RAOIs with ambulatory service</td>
<td>3 LAM + 1 LAM or SAM or RAOI</td>
<td>4 medicines</td>
<td>4 medicines</td>
</tr>
<tr>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
</tr>
<tr>
<td>2 surgeries total: 1 SAS + 1 ESAS or shelter or shelter RAOI</td>
<td>2 LAS or 1 LAS + 1 Bov Sx or RAOI</td>
<td>2 LAS</td>
<td>2 surgeries</td>
<td>2 surgeries</td>
</tr>
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<td>Orientation to clinics</td>
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</tr>
<tr>
<td>1 public health</td>
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<td>1 public health</td>
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<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
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</tr>
<tr>
<td>1 necropsy</td>
<td>1 necropsy</td>
<td>1 necropsy</td>
<td>1 necropsy</td>
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<tr>
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<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
</tr>
<tr>
<td>1 radiology</td>
<td>1 radiology or imaging RAOI</td>
<td>1 radiology or radiology RAOI</td>
<td>1 radiology</td>
<td>1 radiology</td>
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<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
</tr>
<tr>
<td>2 GP + 1 Dent + 1 ECC + 1 Derm or Derm RAOI</td>
<td>DOFC or SwHPI + 6 FA rotations</td>
<td>1 ELamP + 1 EqAmb + EqThI + 3 equine rotations</td>
<td>1 GP + 1 ECC + 4 FA, Eq or SA rotations</td>
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</tr>
<tr>
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<tr>
<td>3-5 externships*/RAOIs</td>
<td>3-5 externships*/RAOIs</td>
<td>3-5 externships*/RAOIs</td>
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<td>6-8 elective rotations</td>
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<td>4-6 elective rotations</td>
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<td>16 elective rotations, externships*, or RAOIs</td>
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<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
<td>Orientation to clinics</td>
</tr>
</tbody>
</table>

**28 total** | **28 total** | **28 total** | **28 total** | **28 total**

* One externship must be a general practice-type experience in a revenue-generating for-profit facility
† An extra 2 weeks of externship may be taken in place of one elective rotation with mentor approval for externships requiring longer blocks of attendance

Bov sx = bovine surgery, Dent = small animal dentistry, Derm = comparative dermatology, DOFC = dairy on-farm campus (DEC), ECC = small animal emergency/critical care, ELamP = equine lameness and podiatry, Eq = equine, EqAmb = equine ambulatory, EqThI = introductory equine theriogenology, ESAS = elective small animal surgery, FA = food animal, GP = general practice, LAM = large animal medicine, LAS = large animal surgery, RAOI = rotation at an outside institution, SA = small animal, SAM = small animal medicine, SAS = small animal surgery, SmRum = small ruminant, SwHPI = introduction to swine health and production, SwPPDxT = swine diseases, diagnostics, therapeutics, and prevention
CURRICULUM – CLASSES OF 2014-2016

Year 1 – Fall semester – Core courses
CVM 6000 Gopher Orientation and Leadership Experience (1 cr) Orientation to the veterinary program, introduction to academic and personal skills necessary for success in the curriculum and profession, peer and faculty mentoring. Small group
CVM 6005 Foundations of Interprofessional Communication and Collaboration (1 cr) Knowledge of other health professions and experiential team-based communications in interprofessional groups, including medicine, nursing, pharmacy, dietetics, clinical laboratory science, public health, dentistry, and veterinary medicine. Small group
CVM 6011 Professional Development I (1 cr) Introduction to the veterinary profession, personal management, and personal finance. Lecture
CVM 6021 Overview of Animal Populations (1 cr) Introduction to production agriculture, population medicine, veterinary career paths. Lecture/Experiential
CVM 6100 Anatomy (5 cr) Gross and developmental anatomy of domesticated mammals. Carnivore dissection uses the dog as a model with comparative features of the cat. Ungulate dissection focuses on the horse with emphasis on clinically important aspects of ruminant and swine anatomy. Lecture/Laboratory
CVM 6101 Normal Radiographic Anatomy (1 cr) Introduction to radiological principles and radiation safety. Normal radiographic anatomy on plain films and some special studies. Lecture/Laboratory
CVM 6110 Veterinary Physiological Chemistry (3 cr) Metabolism, structure, and metabolic function of cells and tissues, gene expression. Lecture
CVM 6111 Histology (3 cr) Introduction to microscopic/ultrastructural morphology of cells, tissues, and certain organs. Lecture/Laboratory
CVM 6134 Principles of Veterinary Nutrition (1 cr) Introduction to principles of nutrition. Basic applications and food sources for major domestic species. Lecture/Laboratory
CVM 6301 Clinical Skills I (1 cr) Basic large animal handling/management skills. Introduction to physical examination. Clerk duty in large animal hospital. Lecture/Laboratory

Year 1 – Spring semester – Core courses
CVM 6004 Critical Scientific Reading (1 cr) Introduction to critical analysis and review of scientific literature, statistical analysis, evidence-based medicine. Lecture/Small group
CVM 6012 Professional Development II (1 cr) Communications and ethics training. Lecture/Small group
CVM 6112 Organology (3 cr) Microscopic ultrastructural morphology of organ systems. Lecture/Laboratory
CVM 6120 Veterinary Neurobiology (2 cr) Anatomy and physiology of the central nervous system and special senses. Lecture
CVM 6130 Veterinary Physiology (6 cr) Fundamental principles of systemic physiology through survey of major organ systems. Lecture
CVM 6141 Veterinary Pharmacology (2 cr) Principles of pharmacokinetics and clinical applications in animal patients. Pharmacology of drugs affecting the autonomic nervous system, cardiovascular system, respiratory and digestive tracts, and kidneys, and anti-allergic/anti-inflammatory drugs. Lecture
CVM 6201 Host Defenses (3 cr) Introduction to immunology, including innate and adaptive immunity, cells and molecules involved in protection against infectious agents and cancers. Overview of antibody-antigen-based testing, immune-mediated diseases. Lecture
CVM 6204 Infectious Agents: Virology (3 cr) Overview of viruses that affect animal species of veterinary significance, including pathology, clinical manifestations, management, and prevention of disease. Lecture/Small group
CVM 6211 Applied Veterinary Genetics (1 cr) Overview of general, molecular, and cytogenetics relevant to animal health, disease, breeding, and production. Lecture
CVM 6298 Basic Pathology (2 cr) Reactions of cells/tissues to injury, including regressive changes, cell death, pigments, circulatory disturbances, inflammation, alterations of cell growth. Lecture/Laboratory
CVM 6302 Clinical Skills II (1 cr) Basic small animal handling, physical exam, and procedures. Lecture/Laboratory
CVM 6441 Behavior Core (2 cr) Ethology, psychopharmacology, behavior genetics, small/large animal behavior, and behavior modification. Lecture

Year 1 – Elective courses
CVM 6001 Opportunities in International and Cultural Immersion (0.5 cr) Cultural competence and travel safety, funding opportunities for international education. Lecture/Experiential
CVM 6003 Clinical Correlations (2 cr) Problem-based assessment of common concerns in domestic animal with peer teaching and curricular integration. Small group
CVM 6050 Perspectives: Interrelationships of People and Animals in Society (2 cr) Social, economic, legislative, and health consequences of human/animal interaction. Lecture/Discussion
CVM 6512 Zoo and Wildlife Rounds (0.5 cr) Selected topics in conservation, management, and pathology of zoo animals, wildlife, and exotic pets. Lecture/Discussion

**Year 2 – Fall semester – Core courses**

CVM 6013 Professional Development III (2 cr) Experiential communications training, cultural competence. Lecture/Experiential/CVM 6132 Reproductive biology (2 cr) Physiology of reproduction, including lactation. Lecture/CVM 6142 Veterinary neuropharmacology (1 cr) Pharmacology of drugs affecting the central nervous system. Lecture/CVM 6202 Infectious Agents: Parasitology (4 cr) Study of protozoan, arthropod, and helminth parasites of animals. Lecture/Laboratory/CVM 6203 Infectious Agents: Bacteriology (3.5 cr) Microbiology and mycology with laboratory sessions. Lecture/Laboratory/CVM 6205 Infectious Agents: Pharmacology (1.5 cr) Clinical pharmacology of antimicrobials, antifungals, anthelmintics, and chemotherapeutic drugs. Lecture/CVM 6220 Clinical Epidemiology (1.5 cr) Statistical and epidemiological concepts applied to veterinary medicine. Lecture/CVM 6299 Systemic Pathology (5 cr) Reactions of specific organs systems to injury. Applications to diagnosis of specific diseases at gross/microscopic level. Lecture/Small group/Laboratory/CVM 6303 Clinical Skills III (1 cr) Observation and practice of clinical skills in the Veterinary Medical Center (including large animal clerk duty) and through community preceptorships. Experiential/CVM 6400 Skin and Adnexa (3 cr) Pathophysiology, presentation, diagnostic and therapeutic approaches, and management protocols for common dermatologic disorders in small and large animals. Lecture/Laboratory/CVM 6420 Swine Core (2 cr) Swine medicine, production, and health management. Lecture

**Year 2 – Spring semester – Core courses**

CVM 6014 Professional Development IV (2 cr) Medical records creation and management, clinical decision-making. Lecture/Small group/CVM 6102 Veterinary Imaging I (2 cr) Cardiopulmonary and urogenital systems. Interpretation of film and digital radiographs germane to common animal diseases. Lecture/Laboratory/CVM 6195 Veterinary Toxicology (3 cr) Toxicology of minerals, pesticides, venoms, and various toxins. Identification of poisonous plants. Recognition, diagnosis, and treatment of animal poisons. Lecture/CVM 6304 Clinical Skills IV (1 cr) Observation and practice of clinical skills in the Veterinary Medical Center (including large animal clerk duty) and through community preceptorships. Experiential/CVM 6321 Surgery, Anesthesia, Critical Care (4 cr) Introduction to principles/techniques for conducting surgical procedures, managing uncomplicated anesthesia, and providing critical care for common situations in small and large animals. Lecture/Laboratory/CVM 6430 Cardiopulmonary System Diseases (4 cr) Pathophysiology, presentation, diagnostic and therapeutic approaches, and management protocols for common disorders of the cardiovascular and pulmonary systems in small and large animals. Lecture/CVM 6440 Nervous System Disorders (2 cr) Pathophysiology, presentation, diagnostic and therapeutic approaches, and management protocols for common disorders of the nervous system in small and large animals. Lecture/CVM 6444 Ophthalmology (2 cr) Pathophysiology, presentation, diagnostic and therapeutic approaches, and management protocols for common disorders of the eye and surrounding tissues in small and large animals. Lecture/CVM 6460 Urinary System Disorders (2 cr) Pathophysiology, presentation, diagnostic and therapeutic approaches, and management protocols for common disorders of the urinary system in small and large animals. Lecture/CVM 6480 Obstetrics (1 cr) Diagnosis and management of dystocia in large animals. Lecture/CVM 6534 Veterinary Clinical Pathology (4 cr) Hematology, cytology, and serum chemistry analysis. Integration of diagnostic plan, generation of clinical pathology data, statistical concepts, interpretation of results to guide patient management. Lecture/CVM 6880 Avian Core (2 cr) Avian anatomy, physiology, nutrition, and disease. Lecture
Year 2 – Elective courses
CVM 6001 Opportunities in International and Cultural Immersion (0.5 cr) Cultural competence and travel safety, funding opportunities for international education. Lecture/Experiential
CVM 6003 Clinical Correlations (2 cr) Problem-based assessment of common concerns in domestic animals, with peer teaching and curricular integration. Small group
CVM 6050 Perspectives: Interrelationships of People and Animals in Society (2 cr) Social, economic, legislative, and health consequences of human/animal interaction. Lecture/Discussion
CVM 6222 Advanced Clinical Epidemiology (1 cr) Application of epidemiologic principles to control of infectious diseases in animal populations. Global impact of infectious disease, disease outbreak investigation, economics of disease control/surveillance. Lecture
CVM 6481 Obstetrics Laboratory (1 cr) Techniques for pregnancy diagnosis, obstetrical manipulation in large animals. Laboratory
CVM 6512 Zoo and Wildlife Rounds (0.5 cr) Selected topics in conservation, management, and pathology of zoo animals, wildlife, and exotic pets. Lecture/Discussion
CVM 6560 Introduction to Public Health Issues and Veterinary Medicine Opportunities (1 cr) Introduction to public health practice and association with veterinary medicine. Career options. Public health principles in context. Lecture
CVM 6690 Integrative Medicine (2.5 cr) History and principles of acupuncture, chiropractic, and other complementary approaches to care of domestic animals. Lecture
CVM 6718 Large Animal Community Based Practice Mentoring (1 cr) Experiential handling and management of large animals, mentoring. Experiential
CVM 6930 Medical Management of Zoo Animals (1 cr) Zoo animal handling techniques and preventive medicine for zoo animal species. Lecture/Discussion

Year 3 – Fall semester – Core courses
CVM 6027 Large Animal Hospital Practicum (1 cr) After-hours care of hospitalized/emergency cases in the large animal hospital. Experiential
CVM 6029 Small Animal Hospital Practicum (1 cr) Management of dogs/cats requiring urgent medical care, intensive medical management in the small animal Intensive Care Unit. Experiential
CVM 6042 Practice Management, Law, and Ethics (2 cr) Economics, marketing, personnel management, accounting issues in veterinary practice management. Legal/ethical parameters for veterinary practice. Lecture
CVM 6103 Veterinary Imaging II (2 cr) Musculoskeletal, general abdomen, and alimentary systems. Interpretation of film and digital radiographs germane to common animal diseases. Lecture/Laboratory
CVM 6305 Clinical Skills V (1 cr) Core systems-specific clinical skills used in small animal practice. Laboratory
CVM 6410 Large Animal Digestive Disorders (2 cr) Pathophysiology, presentation, diagnostic and therapeutic approaches, and management protocols for common disorders of the digestive system in large animals. Lecture
CVM 6411 Small Animal Gastroenterology (3 cr) Pathophysiology, presentation, diagnostic and therapeutic approaches, and management protocols for common disorders of the digestive system in small animals. Lecture/Laboratory
CVM 6420 Musculoskeletal System Diseases (2 cr) Pathophysiology, presentation, diagnostic and therapeutic approaches, and management protocols for common disorders of the musculoskeletal system in small and large animals. Lecture
CVM 6448 Oncology (2 cr) Pathophysiology, presentation, diagnostic and therapeutic approaches, and management protocols for common neoplasms in small and large animals. Lecture
CVM 6451 Metabolic Disorders (3 cr) Endocrine and metabolic disorders in all species. Unique metabolic problems of large animals. Pediatrics/geriatrics in small animals. Lecture
CVM 6472 Small Animal Infectious Diseases (1 cr) Pathophysiology, presentation, diagnostic and therapeutic approaches, and management protocols for infectious disease in small animals. Lecture
CVM 6473 Large Animal Infectious Diseases (1 cr) Pathophysiology, presentation, diagnostic and therapeutic approaches, and management protocols for infectious disease in large animals. Lecture
CVM 6474 Hematologic and Immunologic Disorders (1 cr) Pathophysiology, presentation, diagnostic and therapeutic approaches, and management protocols for common disorders of the hematologic and immunologic systems in small and large animals. Lecture
CVM 6483 Theriogenology Diagnostic Techniques (1 cr) Techniques for diagnosis and treatment of common disorders of the reproductive system in small and large animals. Lecture

One lecture or laboratory from the following required by track:
CVM 6482 Reproductive Diseases of Small Animals (1 cr) Reproductive physiology, breeding management and artificial insemination, and diagnosis, treatment, and control of common disorders of the reproductive tract in dogs, cats, rabbits, and pocket pets. Lecture
CVM 6702 Large Animal Palpation Laboratory (2 cr) Hands-on clinical experiences in diagnosis and management of reproduction status and disorders in horses and cattle. Laboratory
CVM 6704 Reproductive Diseases of Cattle (2 cr) Diagnosis, treatment, and control of the most important disorders of the reproductive tract in cattle. Lecture
CVM 6727 Equine Palpation Laboratory (1 cr) Hands-on clinical experiences in diagnosis and management of reproduction status and disorders in horses. Laboratory
CVM 6728 Reproductive Diseases of the Horse (1 cr) Reproduction patterns, breeding practices, management, artificial insemination, economics of reproductive performance, and infertility in horses. Lecture
CVM 6800 Bovine Palpation Laboratory (1 cr) Hands-on clinical experiences in diagnosis and management of reproduction status and disorders in cattle. Laboratory

Year 3 – Spring semester – Core courses plus at least 6 credits of electives with requirements varying by track
CVM 6027 Large Animal Hospital Practicum (1 cr) After-hours care of hospitalized/emergency cases in the large animal hospital. Experiential
CVM 6029 Small Animal Hospital Practicum (1 cr) Management of dogs/cats requiring urgent medical care, intensive medical management in the Small Animal Intensive Care unit. Experiential
CVM 6030 Public Health (2 cr) Epidemiological approach to veterinary public health. Major zoonoses, animal sentinels, meat/milk inspection, food safety, environment, occupational health/safety, euthanasia and carcass disposal methods, cruelty investigation, animal welfare issues. Lecture
CVM 6031 International Diseases (1 cr) Epidemiology, clinical signs, differential diagnoses, pathology, economic effect of diseases not currently or only intermittently present in the United States. International role of veterinarians in controlling disease, increasing food production, and facilitating trade. Information about APHIS accreditation. Lecture/Online
CVM 6494 Small Animal Anesthesia Core (1 cr) Specifics of regional and general anesthesia in small animals, including pediatric and geriatric patients and special cases, ventilator use, anesthesia complications, pain control. Lecture
CVM 6495 Nontraditional Pets (1 cr) General and reproductive biology, behavior, husbandry, nutrition, restraint and handling, and anesthesia, diagnosis, and management of common disorders of special species commonly encountered in small/mixed animal practices including mammals, reptiles, and basic aquarium species. Lecture/Laboratory
CVM 6530 Orientation to Clinical Rotations (1 cr) Medical records (UVIS), infection control and isolation procedures, communications review, hospital policies and procedures, radiation safety, rotation assessment, state and national licensure. Lecture/Experiential

Year 3 – Elective courses
CVM 6001 Opportunities in International and Cultural Immersion (0.5 cr) Cultural competence and travel safety, funding opportunities for international education. Lecture/Experiential
CVM 6105 Small Animal Ultrasound (1 cr) Body systems approach to imaging in small animals. Ultrasonographic physics and technique. Lecture
CVM 6136 Small Animal Nutrition Advanced (2.5 cr) Nutritional considerations in health and treatment of disease in small animals. Lecture/Laboratory
CVM 6306 Small Animal Clinical Skills: Advanced Block (1 cr) Advanced clinical skills used by small animal practitioners in private practice. Laboratory
CVM 6307 Clinical Skills Elective (1 cr) Hands-on basic and intermediate technical skills on small animals, practiced at approved external locations. Laboratory
CVM 6404 Small Animal Dermatology (1 cr) Case-based discussion of diagnostic and therapeutic considerations in small animal dermatology for advanced small animal practice. Lecture/Small group
CVM 6424 Small Animal Orthopedic Advanced (1 cr) Common orthopedic problems in pediatric and adult dogs and cats. Lecture/Laboratory
CVM 6434 Critical Care Advanced Block (1 cr) Case-based discussions of common emergencies. Emergency procedures, intensive care monitoring, blood gas interpretation, principles of CPR. Lecture/Laboratory
CVM 6436 Small Animal Cardiology (1 cr) Case-based discussions of diagnostic and therapeutic considerations in small animal cardiology for advanced small animal practice. Lecture
CVM 6442 Small Animal Behavior (1 cr) Introduction to abnormal/undesired animal behavior, diagnostic procedures, and behavioral/pharmacological therapies. Lecture
CVM 6461 A Clinician’s Analysis of Urinalysis (1 cr) Case-based in-depth approach to evaluation of urinalyses of clinical cases recently admitted to the VMC. Lecture/small group
CVM 6464 Small Animal Urinary System Disorders (1 cr) Expansion on core urinary tract disorders course. Case-based discussion of diagnostic and therapeutic considerations in small animal nephrology and urology for advanced small animal practice. Lecture/small group
CVM 6471 Small Animal Problems (2 cr) Problem-oriented approach to canine and feline cases with medical problems. Emphasis is on use of resources to assess the problem, communication of assessment in writing, and development of a diagnostic plan. Discussion

CVM 6497 Avian Medicine and Surgery (1 cr) Bacterial, viral, fungal, and parasitic diseases of companion birds, including caged birds, raptors, racing pigeons, and waterfowl. Behavioral components of commonly problems. Capture/restraint, radiology, anesthesia. Overview of problems managed surgically. Lecture/Laboratory

CVM 6512 Zoo and Wildlife Rounds (0.5 cr) Selected topics in conservation, management, and pathology of zoo animals, wildlife, and exotic pets. Lecture/Discussion


CVM 6610 Small Animal Dentistry and Oral Surgery Elective (2 cr) Dentistry and oral surgery of dogs and cats, with some information about exotic animal dentistry. Lecture/Laboratory

CVM 6681 Advanced Small Animal Theriogenology (1 cr) Evidence-based approach to answering advanced questions in small animal theriogenology and pediatrics. Online

CVM 6690 Integrative Medicine (2.5 cr) History and principles of acupuncture, chiropractic, and other complementary approaches to care of domestic animals. Lecture

CVM 6731 Equine Advanced Elective: Surgery (2 cr) Intensive laboratory course, advanced equine medicine, surgery, theriogenology techniques. Laboratory

CVM 6752 Advanced Equine Elective I (3.5 cr) Diagnostic and therapeutic considerations in equine medicine and surgery for advanced equine practice.

CVM 6753 Advanced Equine Elective II (2 cr) Continuation of CVM 6752; Diagnostic and therapeutic considerations in equine medicine and surgery for advanced equine practice. Lecture

CVM 6790 Advanced Small Ruminant Practice (1.5 cr) Diagnostic and therapeutic considerations in small ruminant medicine for advanced small ruminant practice. Lecture/Experiential

CVM 6793 Small Ruminant Reproduction (1.5) Breeding soundness and reproductive management, diagnosis, treatment and management of common reproductive disorders in sheep and goats. Special topics in camelids. Captive breeding programs for wild hoof stock. Lecture

CVM 6801 Advanced Bovine Practice Laboratory (1 cr) In-depth coverage of topics dairy production medicine at the management, preventive, and herd levels. Lecture/Laboratory

CVM 6805 Food and Exotic Large Animal Anesthesia (0.5 cr) Techniques and complications of sedation, local anesthesia, and general anesthesia in ruminants, pigs, and some large exotic species. Lecture

CVM 6810 Food Animal Basics (2 cr) Therapeutic principles and vaccinology; animal housing and welfare, diagnostic approaches for populations, genetic improvement, biosecurity in food animal species. Lecture

CVM 6841 Swine Behavior (0.5 cr) Common considerations in swine behavior. Lecture

Year 4 – Clinical Rotations – Core Rotations All rotations are worth 2 credits and all are experiential.

CVM 6500 Veterinary Public Health – Clinical rotation – CVM – Public health, regulatory, and community activities, roles in food industry, public/environmental/occupational health, zoonoses, food safety, euthanasia and carcass disposal, emergency preparedness, USDA accreditation.

CVM 6502 Necropsy – Clinical rotation – VDL – Necropsy performance, tissue collection, interpretation and reporting of clinicopathologic findings.

CVM 6532 Clinical Laboratory Medicine – Clinical rotation – CVM – One-week intensive rotation in veterinary clinical laboratory medicine. Hematology, cytology, clinical chemistry, endocrinology, microbiology, sample handling and submission, laboratory test methodology.

CVM 6601 Small Animal Medicine – Clinical rotation – VMC – Primary case responsibility for wide range of clinical diseases. History taking, physical examination, problem definition, diagnostic and treatment planning, case management.

CVM 6662 Comparative Anesthesiology – Clinical rotation – VMC and Equine Center – Practical experience in sedating/anesthetizing routine clinical cases. Student exposure to healthy, normal animals, and high-risk anesthesia patients. Creation of anesthetic plan, patient monitoring and management, teamwork, pain control.

CVM 6663 Small Animal Surgery – Clinical rotation – VMC – Diagnostic and therapeutic management of surgical patients. History taking, physical examination, communication, problem-solving, and surgical techniques, economic issues, teamwork.


CVM 6711 Large Animal Medicine – Clinical rotation – VMC and Equine Center – Medical diseases of horses, cattle, small ruminants, camels, potbellied pigs. History taking, physical examination, clinical diagnosis, treatment, and patient management.

CVM 6715 Large Animal Surgery – Clinical rotation – VMC and Equine Center – General surgery, lameness in horses, with exposure to cattle, small ruminants, camels. History taking, physical examination, diagnostic and therapeutic management.

Year 4 – Clinical Rotations – Elective Rotations with requirements varying by track

COMPARATIVE SERVICES
CVM 6503 Exotic Animal Necropsy – Clinical rotation – VDL – Pathophysiology and clinical manifestations of disease in non-domestic animals.
CVM 6511 Exotic Animal Medicine – Clinical rotation – VDL – Case management and pathobiology of disease in non-domestic animals.
CVM 6634 Comparative Ophthalmology – Clinical rotation – VMC – Entry-level clinical ophthalmology. Diagnosis and treatment of common ophthalmic disorders in large and small animals.
CVM 6691 Veterinary Acupuncture – Clinical rotation – VMC – Basic veterinary acupuncture theory, point combination, diagnosis and treatment of disease.
CVM 6933 Zoological Medicine – Clinical rotation – Minnesota Zoo – Introduction to all aspects of health care of zoo animals. Housing, nutrition, preventive health programs. Students assist zoo veterinarians with immobilizations, examinations, necropsies, laboratory work, and record keeping.

EQUINE
CVM 6712 Equine Ambulatory – Clinical rotation – West Metro Equine Clinic – On-site history taking, physical examination, diagnostic and treatment planning, and case management of equine cases.
CVM 6733 Equine Dentistry and Nutrition – Clinical rotation – Equine Center – Dental health care and nutrition for horses.
CVM 6736 Equine Lameness and Podiatry – Clinical rotation – Equine Center – Diagnosis and treatment of equine lameness and hoof disorders.
CVM 6747 Equine Theriogenology Introduction – Clinical rotation – Equine Center – Handling of mares and stallions, practice in basic techniques in equine reproduction.
CVM 6748 Equine Theriogenology Advanced – Clinical rotation – Equine Center – Student-run breeding management, semen evaluation and freezing, artificial insemination, other advanced techniques in equine reproduction.
CVM 6750 Equine Sports Medicine and Rehabilitation – Clinical rotation – Equine Center – Exercise physiology, rehabilitation therapy, prevention and management of common injuries, practices of athletic conditioning and performance testing.

FOOD ANIMAL
CVM 6531 Biosecurity/Containment for Food Animals – Clinical rotation – VMC – Review and application of principles of bioexclusion and biocontainment of infectious organisms for individual animals and herds.
CVM 6789 Fresh Dairy Doe and Newborn Goat Kid Management – Clinical rotation – Poplar Hill Goat Dairy – Seasonal rotation reviewing clinical management of illnesses of fresh dairy does and kids, including infectious diseases and nutritional deficiencies.
CVM 6792 Small Ruminant Health and Production – Clinical rotation – VMC and external sites – Nutrition/reproductive and health management and diagnosis, treatment, and control/prevention of common diseases in sheep, goats, llamas, and farmed deer.
CVM 6794 Camelid Medicine, Surgery, Reproduction, and Health Management – Clinical rotation – VMC and external sites – Physical examination, basic techniques and common field surgeries, preventive care, tuberculosis testing, necropsy.
CVM 6796 Advanced Feedlot Herd Health – Clinical rotation – VMC and external sites – Beef cattle feedlot production, medicine, health management, production systems, risk assessment and management, common procedures including necropsy and field pathology sampling.
CVM 6797 Cow-Calf Health and Production – Clinical rotation – VMC and external sites – Cow-calf production, medicine, health management, facilities assessment, field diagnostics, preventive care, common field surgeries.
CVM 6804 Bovine Surgery – Clinical rotation – VMC – Technical skills in management of individual cow surgical diseases.
CVM 6806 Food Animal Disease and Diagnostics – Clinical rotation – VDL – Food animal necropsy, diagnostic assays.
CVM 6811 Dairy Theriogenology Palpation – Clinical rotation – External sites – Reproductive management, assessment of data from on-farm reproductive record systems and Dairy Herd Improvement Association reports.
CVM 6813 Farm Animal Reproduction and Delivery Management (MOB) – Clinical rotation – Minnesota State Fair Miracle of Birth Center – Minnesota Veterinary Medical Association reproduction building at the Minnesota State Fair.
Students participate in delivery of calves, lambs, and piglets, and educate the public about processes related to large animal delivery and veterinary care.

CVM 6821 Dairy On-Farm Clinical – Clinical rotation – New Sweden Dairy – Typical transition cow management, clinical veterinary care. Students assist in all day-to-day veterinary management of the dairy.

CVM 6826-6829 Dairy Production Medicine series – Clinical rotation – VMC and New Sweden Dairy – All management aspects of dairy production medicine, including mastitis control, milking equipment, reproductive function of dairy cattle, preventive medicine, economic aspects of dairy production, animal welfare, youngstock management, genetic improvement.

CVM 6831 Overview of Dairy Production Medicine – Clinical rotation – VMC and external sites – Dairy production medicine concepts/skills, including reproductive management, mastitis control, epidemiology, nutrition, youngstock management, housing, lameness, records.

CVM 6842 Swine Disease Diagnostics, Therapeutics, and Prevention – Clinical rotation – VMC and external sites – Major diseases and health technologies, facilities assessment, slaughter checks.

CVM 6854 Introduction to Swine Health and Production – Clinical rotation – VMC and external sites – Field trips to enterprises representing all components of pork production from feed mill to animal production to slaughter and processing. Problem definition and investigation.

CVM 6856 Advanced Swine Health and Production – Clinical rotation – VMC and external sites – Solving of complex, real-life problems in swine production and health.

CVM 6884 Poultry Medicine Clerkship – Clinical rotation – VMC and external sites – All aspects of poultry production and flock management.

OTHER

CVM 6506 Directed Studies: Large Animal – Clinical rotation – Variable – Student, under guidance of a faculty member, conducts a special project in large animal medicine or surgery.

CVM 6507 Directed Studies: Small Animal – Clinical rotation – Variable – Student, under guidance of a faculty member, conducts a special project in small animal medicine or surgery.

CVM 6508 Directed Studies: Pathobiology – Clinical rotation – Variable – Student, under guidance of a faculty member, conducts a special project in pathobiology.

CVM 6509 Directed Studies: Diagnostic Medicine – Clinical rotation – Variable – Student, under guidance of a faculty member, conducts a special project in diagnostic medicine.

DVM 6510 Master’s Project: Public Health Practice – Clinical rotation – Variable – Directed field research. Original or secondary analysis of data sets related to public health practice.

CVM 6515 Externship – Clinical rotation – Variable – Students participate in veterinary medicine at a practice or other professional setting.

CVM 6516 Externship in Public Health Practice – Clinical rotation – Variable – Directed field experience or clinical rotation in selected community or public health agencies/institutions. Integration of knowledge/skills in population science for public health.

CVM 6518 Public Policy – Clinical rotation – External sites including distant travel – Public policy-making at state, national, or international level. Integration of knowledge/skills in animal health, public health, and food safety policy development.

CVM 6525 Rotation at Other Institution – Clinical rotation – External site – Students spend time in an organized program at another degree-granting institution in an area not offered at the University or in one that complements experience in a clinical rotation at the University.

CVM 6526 Dermatology Rotation at Other Institution – Clinical rotation – External site – Students spend time in an organized dermatology program at another degree-granting institution.

CVM 6527 Anesthesiology Rotation at Other Institution – Clinical rotation – External site – Students spend time in an organized anesthesia program at another degree-granting institution.

CVM 6528 Radiology Rotation at Other Institution – Clinical rotation – External site – Students spend time in an organized radiology program at another degree-granting institution.

CVM 6529 Equine Medicine Rotation at Other Institution – Clinical rotation – External site – Students spend time in an organized equine medicine program at another degree-granting institution.

SMALL ANIMAL

CVM 6137 Nutrition – Clinical rotation – VMC – Clinical nutrition in small animal patients, including managing nutritional needs of patients, performing nutritional assessments of ICU patients, performing internal or referral nutritional consultations, and seeing outpatient appointments.

CVM 6605 Banfield – Clinical rotation – Banfield, the Pet Hospital, various locations – Students participate in veterinary medicine at a Banfield practice under the direct supervision of a veterinarian.

CVM 6609 Emergency/Critical Care – Clinical rotation – VMC – Diagnosis and treatment of emergency admissions and management of critical patients in ICU. Hands-on training in common procedures.

CVM 6630 Behavior – Clinical rotation – VMC – Students participate in behavior consultations, including history-taking, diagnosis, outline of treatment protocols, sample collection, demonstration of training techniques, writing of treatment plans, and case follow-up.


CVM 6636 Cardiology – Clinical rotation – VMC – Clinical problem-solving in cases of cardiopulmonary disease. History taking, physical examination, cardiac diagnostic procedures.

CVM 6644 General Practice – Clinical rotation – VMC – Students manage their own cases. History taking, physical examination, creation of diagnostic and treatment plans, case management, communications, client education.

CVM 6648 Oncology – Clinical rotation – VMC – Students receive oncology referrals, work with emergency cases and special procedures, assist in treatment decisions and therapeutic options and manage ongoing chemotherapy/radiation therapy patients. Case management and patient care emphasized.

CVM 6651 Small Animal Ultrasound – Clinical rotation – VMC – Physics of ultrasound, use of ultrasound equipment, review of common ultrasonographic scans and introduction to cardiac ultrasound.

CVM 6661 Neurology – Clinical rotation – VMC – Medical and surgical neurology. History taking, physical and neurologic examination, diagnosis, treatment, and management of neurology cases in small animals.

CVM 6664 ESAS – Clinical rotation – CVM or Animal Humane Society – Elective ovariohysterectomy or castration of dogs and cats, including pre-surgical evaluation, anesthesia induction and maintenance, surgery, and post-operative patient care.

CVM 6665 Small Animal Rehabilitation – Clinical rotation – VMC – Students work closely with a veterinary technician who is a certified canine rehabilitation practitioner under the guidance of a board-certified veterinarian. Establishment of treatment goals, creation of a treatment plan, application of various modalities.

CVM 6882 Companion Bird – Clinical rotation – The Raptor Center and external sites – Avian medicine and surgery relating to companion birds. Hands-on experience in local aviaries and breeding facilities. Acquisition of basic avian clinical skills.

CVM 6883 Raptor Center – Clinical rotation – The Raptor Center – Students participate in all aspects of raptor medicine, surgery, and rehabilitation.

**CURRICULUM – CLASS OF 2017**

**Year 1 – Fall semester – Core courses**

CVM 6000 Gopher Orientation and Leadership Experience (1 cr) Orientation to the veterinary program, introduction to academic and personal skills necessary for success in the curriculum and profession, peer and faculty mentoring. Small group

CVM 6005 Foundations of Interprofessional Communication and Collaboration (1 cr) Knowledge of other health professions and experiential team-based communications in interprofessional groups, including medicine, nursing, pharmacy, dietetics, clinical laboratory science, public health, dentistry, and veterinary medicine. Small group

CVM 6900 Microscopic Anatomy (4 cr) Introduction to microscopic/ultrastructural morphology of cells, tissues, organs and organ systems. Lecture/Laboratory

CVM 6901 Physiology I (5 cr) Fundamental principles of systemic physiology through survey of major organ systems, including neurobiology. Lecture/Laboratory

CVM 6902 Veterinary Biochemistry, Nutrition, and Genetics (3 cr) Metabolism, structure, and metabolic function of cells and tissues, nutrients and nutrition basics, overview of general, molecular, and cytogenetics. Lecture

CVM 6903 Anatomy I (5 cr) Gross and developmental anatomy of domesticated mammals. Carnivore dissection uses the dog as a model with comparative features of the cat. Lecture/Laboratory

CVM 6904 Clinical Skills I (1 cr) Basics of animal handling and restraint, foundational clinical skills in large and small animals. Lecture/Laboratory

CVM 6905 Professional Development I (1 cr) Introduction to the veterinary profession, personal management, and personal finance. Lecture

**Year 1 – Spring semester – Core courses**

CVM 6906 Critical Scientific Reading (1 cr) Introduction to critical analysis and review of scientific literature, statistical analysis, evidence-based medicine. Lecture/Small group

CVM 6907 Professional Development II (2 cr) Social, economic, legislative, and health consequences of human/animal interaction. Introduction to production agriculture, population medicine, veterinary career paths. Lecture/Experiential

CVM 6908 Anatomy II (3 cr) Gross and developmental anatomy of domesticated mammals. Ungulate dissection focuses on the horse with emphasis on clinically important aspects of ruminant and swine anatomy. Lecture/Laboratory
CVM 6909 Clinical Skills II (1 cr) Basics of animal handling and restraint, foundational clinical skills in large and small animals. Lecture/Laboratory
CVM 6910 Physiology II (5 cr) Fundamental principles of systemic physiology through survey of major organ systems, including reproductive biology. Lecture
CVM 6911 Immunology (2 cr) Introduction to immunology, including innate and adaptive immunity, cells and molecules involved in protection against infectious agents and cancers. Overview of antibody-antigen-based testing, immune-mediated diseases. Lecture
CVM 6912 Basic Pathology (2 cr) Reactions of cells/tissues to injury, including retrogressive changes, cell death, pigments, circulatory disturbances, inflammation, alterations of cell growth.
CVM 6913 Agents of Disease I (4 cr) Virology, bacteriology, parasitology of common domestic species. Lecture/Laboratory
CVM 6914 Preventive Medicine (4 cr) Preventive care of common domestic species. Behavior, nutrition, vaccinology, parasite control, reproduction control, management of neonates, biosecurity. Lecture/Online

Year 1 – Elective courses
CVM 6001 Opportunities in International and Cultural Immersion (0.5 cr) Cultural competence and travel safety, funding opportunities for international education. Lecture/Experiential
CVM 6003 Clinical Correlations (2 cr) Problem-based assessment of common concerns in domestic animal with peer teaching and curricular integration. Small group
CVM 6512 Zoo and Wildlife Rounds (0.5 cr) Selected topics in conservation, management, and pathology of zoo animals, wildlife, and exotic pets. Lecture/Discussion
CVM 6560 Introduction to Public Health Issues and Veterinary Medicine Opportunities (1 cr) Introduction to public health practice and association with veterinary medicine. Career options. Public health principles in context. Lecture
CVM 6721 Neonatology (1 cr) Introduction to medical care of critically ill foals. Seasonal participation in clinical management of hospitalized foals. Lecture/Experiential
CVM 6865 Introduction to Swine Production Medicine (1 cr) Contemporary approaches to swine practice, including production, disease management, preventive care. Lecture
CVM 6930 Medical Management of Zoo Animals (1 cr) Zoo animal handling techniques and preventive medicine for zoo animal species. Lecture/Discussion
CVM 6934 Topics in Zoo Animal Medicine (5 cr) Year-long overview of expertise required of a zoo veterinarian, applications to specific captive species. Lecture/Discussion

Year 2 – Fall semester – Core courses
CVM 6917 Agents of Disease II (4 cr) Virology, bacteriology, parasitology of common domestic species. International diseases. Lecture/Small group
CVM 6918 Pharmacology I (3 cr) Principles of pharmacokinetics and clinical applications in animal patients. Pharmacology of drugs affecting the autonomic nervous system, cardiovascular system, respiratory and digestive tracts, and kidneys, and anti-allergic/anti-inflammatory drugs. Clinical pharmacology of antimicrobials, antifungals, anthelmintics, and chemotherapeutic drugs. Lecture
CVM 6919 Systemic Pathology (5 cr) Reactions of specific organs systems to injury. Applications to diagnosis of specific diseases at gross/microscopic level. Lecture/Laboratory
CVM 6920 Clinical Pathology I (2 cr) Hematology, cytology. Integration of diagnostic plan, generation of clinical pathology data, statistical concepts, interpretation of results to guide patient management. Lecture
CVM 6921 Clinical Skills III (1 cr) Advanced clinical skills in large and small animals. Experiential learning at the CVM and external sites. Experiential
CVM 6922 Clinical Epidemiology (2 cr) Statistical and epidemiological concepts applied to veterinary medicine. Lecture
CVM 6923 Public Health (2 cr) Epidemiological approach to veterinary public health. Major zoonoses, animal sentinels, meat/milk inspection, food safety, environment, occupational health/safety, euthanasia and carcass disposal methods, cruelty investigation, animal welfare issues. Lecture
CVM 6924 Small Animal Medicine I (2 cr) Metabolic disorders, pediatrics/geriatrics, infectious diseases of dogs and cats. Lecture
CVM 6925 Diagnostics Laboratory (2 cr) Hands-on diagnostics laboratory, including sample handling, parasitology, microbiology, urinalysis, serologic testing. Laboratory

Year 2 – Spring semester – Core courses
CVM 6926 Small Animal Medicine II (5 cr) Common disorders of organ systems within the abdomen in small animals. Lecture/Laboratory
CVM 6927 Small Animal Surgery I (3 cr) Orthopedic disorders and lameness, and abdominal surgery in small animals. Lecture/Laboratory
CVM 6928 Large Animal Medicine I (3 cr) Common disorders of organ systems within the abdomen in large animals. Lecture
CVM 6929 Large Animal Surgery I (2 cr) Orthopedic disorders, lameness, hoof and foot disorders, and abdominal surgery in large animals. Lecture/Laboratory
CVM 6935 Veterinary Imaging I (3 cr) General principles of interpretation of diagnostic radiographs, musculoskeletal and abdominal radiography in large and small animals. Lecture/Laboratory
CVM 6936 Clinical Skills IV (1 cr) Advanced clinical skills in large and small animals. Experiential learning at the CVM and external sites. Experiential
CVM 6937 Pharmacology II (4 cr) Pharmacology of drugs affecting the central nervous system. Principles of toxicology, diagnosis, and case management. Lecture
CVM 6938 Professional Development III (2 cr) Communications basics, experiential communications training, cultural literacy. Small group/Experiential
CVM 6939 Nontraditional Pets (1 cr) General and reproductive biology, behavior, husbandry, nutrition, restraint and handling, and anesthesia, diagnosis, and management of common disorders of special species commonly encountered in small/mixed animal practices including mammals and basic aquarium species. Lecture/Laboratory
CVM 6941 Avian Core (2 cr) Avian anatomy, physiology, nutrition, and disease. Lecture
CVM 6942 Clinical Pathology II (2 cr) Serum chemistry analysis. Integration of diagnostic plan, generation of clinical pathology data, statistical concepts, interpretation of results to guide patient management. Lecture

Year 2 – Elective courses
CVM 6001 Opportunities in International and Cultural Immersion (0.5 cr) Cultural competence and travel safety, funding opportunities for international education. Lecture/Experiential
CVM 6003 Clinical Correlations (2 cr) Problem-based assessment of common concerns in domestic animal with peer teaching and curricular integration. Small group
CVM 6222 Advanced Clinical Epidemiology (1 cr) Application of epidemiologic principles to control of infectious diseases in animal populations. Global impact of infectious disease, disease outbreak investigation, economics of disease control/surveillance. Lecture
CVM 6512 Zoo and Wildlife Rounds (0.5 cr) Selected topics in conservation, management, and pathology of zoo animals, wildlife, and exotic pets. Discussion
CVM 6560 Introduction to Public Health Issues and Veterinary Medicine Opportunities (1 cr) Introduction to public health practice and association with veterinary medicine. Career options. Public health principles in context. Lecture
CVM 6718 Large Animal Community Based Practice Mentoring (1 cr) Experiential handling and management of large animals, mentoring. Experiential
CVM 6930 Medical Management of Zoo Animals (1 cr) Zoo animal handling techniques and preventive medicine for zoo animal species. Lecture/Discussion

Year 3 – Fall semester – Core courses with some (*) required by track
CVM 6943 Small Animal Medicine III (5 cr) Common disorders of organ systems/tissues outside of the abdomen in small animals. Lecture
CVM 6944 Small Animal Surgery II and Anesthesia (3 cr) Soft tissue and thoracic/head and neck surgery in small animals. Clinical principles of anesthesia in all species, including anesthetic protocols and monitoring, anesthetic equipment, pain control. Lecture/Laboratory
CVM 6945 Large Animal Medicine II (5 cr) Common disorders of organ systems/tissues outside of the abdomen in large animals. Lecture
CVM 6946 Large Animal Surgery II (1.5 cr) Soft tissue and thoracic/head and neck surgery in large animals. Lecture
CVM 6947 Veterinary Imaging II (3 cr) Interpretation of diagnostic radiographs of the thorax, head and neck, and other extra-abdominal structures. Lecture/Laboratory
CVM 6948 Comparative Specialties (3 cr) Diagnosis, treatment, and prevention/control of common dermatologic, ophthalmologic, and behavioral disorders in large and small animals. Lecture
CVM 6949 Comparative Theriogenology (3 cr) Diagnosis, treatment, and prevention/control of common reproductive disorders, breeding soundness examination, and reproduction management in large and small animals. Lecture
CVM 6952 Clinical Skills V (1 cr) Advanced clinical skills in large and small animals. Hospital clerk duty. Experiential
CVM 6953 Professional Development IV (2 cr) Medical records creation and management, clinical decision-making. Economics, marketing, personnel management, accounting issues in veterinary practice management. Lecture
CVM 6954* Large Animal Palpation Laboratory (1 cr) Hands-on clinical experiences in diagnosis and management of reproduction status and disorders in horses and cattle. Laboratory
CVM 6955* Equine Palpation Laboratory (1 cr) Hands-on clinical experiences in diagnosis and management of reproduction status and disorders in horses. Laboratory
CVM 6957* Bovine Palpation Laboratory (1 cr) Hands-on clinical experiences in diagnosis and management of reproduction status and disorders in cattle. Laboratory
Year 3 – Spring semester

CORE
CVM 6959 Orientation to Clinical Rotations (1 cr) Medical records (UVIS), infection control and isolation procedures, communications review, hospital policies and procedures, radiation safety, rotation assessment, state and national licensure. Lecture/Experiential

REQUIRED BY TRACK
CVM 6960 Equine I (4 cr) Track-specific knowledge and skills for any student intending to work with horses. Lecture/Laboratory
CVM 6961 Equine II (3 cr) Track-specific knowledge and skills for any student intending to work exclusively with horses. Lecture/Laboratory
CVM 6962 Equine Problems (2 cr) Problem-oriented approach to equine cases. Discussion
CVM 6963 Food Animal I (4 cr) Track-specific knowledge and skills for any student intending to work with food animals. Lecture/Laboratory
CVM 6964 Food Animal II (3 cr) Track-specific knowledge and skills for any student intending to work exclusively with food animals. Lecture/Laboratory
CVM 6965 Food Animal Problems (2 cr) Problem-oriented approach to food animal cases. Discussion
CVM 6966 Small Animal I (4 cr) Track-specific knowledge and skills for any student intending to work with dogs and cats. Lecture/Laboratory
CVM 6967 Small Animal II (3 cr) Track-specific knowledge and skills for any student intending to work exclusively with dogs and cats. Lecture/Laboratory
CVM 6968 Small Animal Problems (2 cr) Problem-oriented approach to canine and feline cases. Discussion

ELECTIVES
CVM 6497 Avian Medicine and Surgery (1 cr) Bacterial, viral, fungal, and parasitic diseases of companion birds, including caged birds, raptors, racing pigeons, and waterfowl. Behavioral components of common problems. Capture/restraint, radiology, anesthesia. Overview of problems managed surgically. Lecture/Laboratory

Year 4 – Clinical Rotations – Core Rotations All rotations are worth 2 credits and are experiential.

CVM 6500 Veterinary Public Health – Clinical rotation – CVM – Public health, regulatory, and community activities, roles in food industry, public/environmental/occupational health, zoonoses, food safety, euthanasia and carcass disposal, emergency preparedness, USDA accreditation.
CVM 6502 Necropsy – Clinical rotation – VDL – Necropsy performance, tissue collection, interpretation and reporting of clinicopathologic findings.
CVM 6532 Clinical Laboratory Medicine – Clinical rotation – CVM – One-week intensive rotation in veterinary clinical laboratory medicine. Hematology, cytology, clinical chemistry, endocrinology, microbiology, sample handling and submission, laboratory test methodology.
CVM 6601 Small Animal Medicine – Clinical rotation – VMC – Primary case responsibility for wide range of clinical diseases. History taking, physical examination, problem definition, diagnostic and treatment planning, case management.
CVM 6662 Comparative Anesthesiology – Clinical rotation – VMC and Equine Center – Practical experience in sedating/anesthetizing routine clinical cases. Student exposure to healthy, normal animals, and high-risk anesthesia patients. Creation of anesthetic plan, patient monitoring and management, teamwork, pain control.
CVM 6663 Small Animal Surgery – Clinical rotation – VMC – Diagnostic and therapeutic management of surgical patients. History taking, physical examination, communication, problem-solving, and surgical techniques, economic issues, teamwork.
CVM 6711 Large Animal Medicine – Clinical rotation – VMC and Equine Center – Medical diseases of horses, cattle, small ruminants, camels, potbellied pigs. History taking, physical examination, clinical diagnosis, treatment, and patient management.
CVM 6715 Large Animal Surgery – Clinical rotation – VMC and Equine Center – General surgery, lameness in horses, with exposure to cattle, small ruminants, camels. History taking, physical examination, diagnostic and therapeutic management.
Year 4 – Clinical Rotations – Elective Rotations with requirements varying by track

COMPARATIVE SERVICES
CVM 6503 Exotic Animal Necropsy – Clinical rotation – VDL – Pathophysiology and clinical manifestations of disease in non-domestic animals.
CVM 6511 Exotic Animal Medicine – Clinical rotation – VDL – Case management and pathobiology of disease in non-domestic animals.
CVM 6634 Comparative Ophthalmology – Clinical rotation – VMC – Entry-level clinical ophthalmology. Diagnosis and treatment of common ophthalmic disorders in large and small animals.
CVM 6691 Veterinary Acupuncture – Clinical rotation – VMC – Basic veterinary acupuncture theory, point combination, diagnosis and treatment of disease.
CVM 6933 Zoological Medicine – Clinical rotation – Minnesota Zoo – Introduction to all aspects of health care of zoo animals. Housing, nutrition, preventive health programs. Students assist zoo veterinarians with immobilizations, examinations, necropsies, laboratory work, and record keeping.

EQUINE
CVM 6712 Equine Ambulatory – Clinical rotation – West Metro Equine Clinic – On-site history taking, physical examination, diagnostic and treatment planning, and case management of equine cases.
CVM 6733 Equine Dentistry and Nutrition – Clinical rotation – Equine Center – Dental health care and nutrition for horses.
CVM 6736 Equine Lameness and Podiatry – Clinical rotation – Equine Center – Diagnosis and treatment of equine lameness and hoof disorders.
CVM 6747 Equine Theriogenology Introduction – Clinical rotation – Equine Center – Handling of mares and stallions, practice in basic techniques in equine reproduction.
CVM 6748 Equine Theriogenology Advanced – Clinical rotation – Equine Center – Student-run breeding management, semen evaluation and freezing, artificial insemination, other advanced techniques in equine reproduction.
CVM 6750 Equine Sports Medicine and Rehabilitation – Clinical rotation – Equine Center – Exercise physiology, rehabilitation therapy, prevention and management of common injuries, practices of athletic conditioning and performance testing.

FOOD ANIMAL
CVM 6531 Biosecurity/Containment for Food Animals – Clinical rotation – VMC – Review and application of principles of bioexclusion and biocontainment of infectious organisms for individual animals and herds.
CVM 6789 Fresh Dairy Doe and Newborn Goat Kid Management – Clinical rotation – Poplar Hill Goat Dairy – Seasonal rotation reviewing clinical management of illnesses of fresh dairy does and kids, including infectious diseases and nutritional deficiencies.
CVM 6792 Small Ruminant Health and Production – Clinical rotation – VMC and external sites – Nutrition/reproductive and health management and diagnosis, treatment, and control/prevention of common diseases in sheep, goats, llamas, and farmed deer.
CVM 6794 Camelid Medicine, Surgery, Reproduction, and Health Management – Clinical rotation – VMC and external sites – Physical examination, basic techniques and common field surgeries, preventive care, tuberculosis testing, necropsy.
CVM 6796 Advanced Feedlot Herd Health – Clinical rotation – VMC and external sites – Beef cattle feedlot production, medicine, health management, production systems, risk assessment and management, common procedures including necropsy and field pathology sampling.
CVM 6797 Cow-Calf Herd Health and Production – Clinical rotation – VMC and external sites – Cow-calf production, medicine, health management, facilities assessment, field diagnostics, preventive care, common field surgeries.
CVM 6804 Bovine Surgery – Clinical rotation – VMC – Technical skills in management of individual cow surgical diseases.
CVM 6806 Food Animal Disease and Diagnostics – Clinical rotation – VDL – Food animal necropsy, diagnostic assays.
CVM 6811 Dairy Theriogenology Palpation – Clinical rotation – External sites – Reproductive management, assessment of data from on-farm reproductive record systems and Dairy Herd Improvement Association reports.
CVM 6813 Farm Animal Reproduction and Delivery Management (MOB) – Clinical rotation – Minnesota State Fair Miracle of Birth Center – Minnesota Veterinary Medical Association reproduction building at the Minnesota State Fair. Students participate in delivery of calves, lambs, and piglets, and educate the public about processes related to large animal delivery and veterinary care.
CVM 6821 Dairy On-Farm Clinical – Clinical rotation – New Sweden Dairy – Typical transition cow management, clinical veterinary care. Students assist in all day-to-day veterinary management of the dairy.
CVM 6826-6829 Dairy Production Medicine series – Clinical rotation – VMC and New Sweden Dairy – All management aspects of dairy production medicine, including mastitis control, milking equipment, reproductive function
of dairy cattle, preventive medicine, economic aspects of dairy production, animal welfare, youngstock management, genetic improvement.

CVM 6831 Overview of Dairy Production Medicine – Clinical rotation – VMC and external sites – Dairy production medicine concepts/skills, including reproductive management, mastitis control, epidemiology, nutrition, youngstock management, housing, lameness, records.

CVM 6842 Swine Disease Diagnostics, Therapeutics, and Prevention – Clinical rotation – VMC and external sites – Major diseases and health technologies, facilities assessment, slaughter checks.

CVM 6854 Introduction to Swine Health and Production – Clinical rotation – VMC and external sites – Field trips to enterprises representing all components of pork production from feed mill to animal production to slaughter and processing. Problem definition and investigation.

CVM 6856 Advanced Swine Health and Production – Clinical rotation – VMC and external sites – Solving of complex, real-life problems in swine production and health.

CVM 6884 Poultry Medicine Clerkship – Clinical rotation – VMC and external sites – All aspects of poultry production and flock management.

OTHER

CVM 6506 Directed Studies: Large Animal – Clinical rotation – Variable – Student, under guidance of a faculty member, conducts a special project in large animal medicine or surgery.

CVM 6507 Directed Studies: Small Animal – Clinical rotation – Variable – Student, under guidance of a faculty member, conducts a special project in small animal medicine or surgery.

CVM 6508 Directed Studies: Pathobiology – Clinical rotation – Variable – Student, under guidance of a faculty member, conducts a special project in pathobiology.

CVM 6509 Directed Studies: Diagnostic Medicine – Clinical rotation – Variable – Student, under guidance of a faculty member, conducts a special project in diagnostic medicine.

DVM 6510 Master’s Project: Public Health Practice – Clinical rotation – Variable – Directed field research. Original or secondary analysis of data sets related to public health practice.

CVM 6515 Externship – Clinical rotation – Variable – Students participate in veterinary medicine at a practice or other professional setting.

CVM 6516 Externship in Public Health Practice – Clinical rotation – Variable – Directed field experience or clinical rotation in selected community or public health agencies/institutions. Integration of knowledge/skills in population science for public health.

CVM 6518 Public Policy – Clinical rotation – External sites including distant travel – Public policy-making at state, national, or international level. Integration of knowledge/skills in animal health, public health, and food safety policy development.

CVM 6525 Rotation at Other Institution – Clinical rotation – External site – Students spend time in an organized program at another degree-granting institution in an area not offered at the University or in one that complements experience in a clinical rotation at the University.

CVM 6526 Dermatology Rotation at Other Institution – Clinical rotation – External site – Students spend time in an organized dermatology program at another degree-granting institution.

CVM 6527 Anesthesiology Rotation at Other Institution – Clinical rotation – External site – Students spend time in an organized anesthesia program at another degree-granting institution.

CVM 6528 Radiology Rotation at Other Institution – Clinical rotation – External site – Students spend time in an organized radiology program at another degree-granting institution.

CVM 6529 Equine Medicine Rotation at Other Institution – Clinical rotation – External site – Students spend time in an organized equine medicine program at another degree-granting institution.

SMALL ANIMAL

CVM 6137 Nutrition – Clinical rotation – VMC – Clinical nutrition in small animal patients, including managing nutritional needs of patients, performing nutritional assessments of ICU patients, performing internal or referral nutritional consults, and seeing outpatient appointments.


CVM 6605 Banfield – Clinical rotation – Banfield, the Pet Hospital, various locations – Students participate in veterinary medicine at a Banfield practice under the direct supervision of a veterinarian.

CVM 6609 Emergency/Critical Care – Clinical rotation – VMC – Diagnosis and treatment of emergency admissions and management of critical patients in ICU. Hands-on training in common procedures.

CVM 6630 Behavior – Clinical rotation – VMC – Students participate in behavior consultations, including history-taking, diagnosis, outline of treatment protocols, sample collection, demonstration of training techniques, writing of treatment plans, and case follow-up.
CVM 6636 Cardiology – Clinical rotation – VMC – Clinical problem-solving in cases of cardiopulmonary disease. History taking, physical examination, cardiac diagnostic procedures.
CVM 6644 General Practice – Clinical rotation – VMC – Students manage their own cases. History taking, physical examination, creation of diagnostic and treatment plans, case management, communications, client education.
CVM 6648 Oncology – Clinical rotation – VMC – Students receive oncology referrals, work with emergency cases and special procedures, assist in treatment decisions and therapeutic options and manage ongoing chemotherapy/radiation therapy patients. Case management and patient care emphasized.
CVM 6651 Small Animal Ultrasound – Clinical rotation – VMC – Physics of ultrasound, use of ultrasound equipment, review of common ultrasonographic scans and introduction to cardiac ultrasound.
CVM 6661 Neurology – Clinical rotation – VMC – Medical and surgical neurology. History taking, physical and neurologic examination, diagnosis, treatment, and management of neurology cases in small animals.
CVM 6664 ESAS – Clinical rotation – CVM or Animal Humane Society – Elective ovariohysterectomy or castration of dogs and cats, including pre-surgical evaluation, anesthesia induction and maintenance, surgery, and post-operative patient care.
CVM 6665 Small Animal Rehabilitation – Clinical rotation – VMC – Students work closely with a veterinary technician who is a certified canine rehabilitation practitioner under the guidance of a board-certified veterinarian. Establishment of treatment goals, creation of a treatment plan, application of various modalities.
CVM 6882 Companion Bird – Clinical rotation – The Raptor Center and external sites – Avian medicine and surgery relating to companion birds. Hands-on experience in local aviaries and breeding facilities. Acquisition of basic avian clinical skills.
CVM 6883 Raptor Center – Clinical rotation – The Raptor Center – Students participate in all aspects of raptor medicine, surgery, and rehabilitation.
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**Award for veterinary research excellence.** Dr. Alvin Beitz, professor and chair, VBS, received the Zoetis Award for Excellence in Research. This annual award is meant to foster innovative research, on which the scientific advancement of the veterinary profession depends, by recognizing outstanding research effort and productivity.

**Discovery: Seeds from box elder tree cause muscle disease in horses.** Led by Dr. Stephanie Valberg, researchers at the University of Minnesota Equine Center discovered that a toxin in the seeds of the box elder tree cause seasonal pasture myopathy, a devastating muscle disease in horses. Research also found that toxins from the seeds of the tree *Acer pseudoplatanus* are the likely cause of atypical myopathy, a highly fatal muscle disease in Europe.

**Gene’s contribution to asthma susceptibility.** Research by Dr. Srirama Rao, Dr. Sung Gil Ha, and their colleagues uncovered the role gene ORMDL3 plays in asthma. Recently linked to asthma susceptibility, ORMDL3 was also connected to the body’s ability to recruit inflammatory cells during an airway allergic reaction. Study findings were published in the journal *Nature Communications*.

**Best presentation.** Dr. Peter Davies, professor, VPM, received a Best Presentation Award for "Longitudinal Study of *Staphylococcus aureus* and MRSA Colonization of U.S. Swine Veterinarians" at the 10th International Conference on the Epidemiology and Control of Foodborne Pathogens in Pork (SafePork).

**Test for porcine epidemic diarrhea virus.** Researchers at the VDL developed a rapid diagnostic test for porcine epidemic diarrhea virus (PEDV), a virus that migrated to the United States in April 2013, infecting pigs in 17 states. The first-of-its-kind test provided a way to quickly and cost-effectively identify the presence of U.S. PEDV strains.

**U.S. patent.** Dr. Michael Murtaugh, professor, VBS, was issued a U.S. patent for intellectual property, “Identifying Virally Infected and Vaccinated Organisms.”

**First U.S. member of international research quality group.** Dr. Rebecca Davies, director of Quality Central (the internal service organization that provides tools and support for integrating quality assurance practices into CVM service and research programs) joined the Outreach Working Party of the international Research Quality Association (RQA). Dr. Davies is the only member from the United States. The mission of the RQA is to develop and promote quality standards in scientific research and development, facilitate knowledge-sharing and transfer, and liaise with regulatory agencies in the development and interpretation of regulations and guidance.

**Distinguished Veterinary Immunologist.** The Board of Governors of the American Association of Veterinary Immunologists (AAVI) named Dr. Michael P. Murtaugh the AAVI Distinguished Veterinary Immunologist for 2012. A professor in VBS, Dr. Murtaugh was selected for the award from a pool of nine nominees.

**Kentucky Equine Research Hall of Fame inductee.** Dr. Stephanie Valberg, director of the Equine Center, VPM, was inducted into the University of Kentucky Equine Research Hall of Fame on September 23, 2012. The Equine Research Hall of Fame is the highest honor for a lifetime of contribution to the body of knowledge in equine research, and for a scientist to have merited such distinction is a great tribute to their work. Dr. Valberg was the first woman to receive the award. In December 2012, she delivered the American Association of Equine Practitioners’ Frank J. Milne State-of-the-Art Lecture, becoming the first female practitioner selected for the honor.

**Extraordinary influence.** Dr. John Fetrow, professor, VPM, was named by *Bovine Veterinarian* as one of 20 veterinarians who have had extraordinary influence on the beef or dairy industries in the past 20 years.

**New ways to predict and control seizures.** The Mayo Clinic and partners from the University of Minnesota College of Veterinary Medicine and College of Pharmacy, University of Pennsylvania School of Veterinary Medicine, Perelman School of Medicine at the University of Pennsylvania, and NeuroVista Corporation were awarded a five-year, $7.5 million grant from the National Institutes of Health (NIH) to study new ways to predict and control epileptic seizures in dogs and people. Dr. Ned Patterson, VCS, is the principal investigator at the college.

**Publication in genetic research.** Drs. Jim Mickelson (VBS), Molly McCue (VPM), and Jessica Petersen were among the authors of "Mutations in DMRT3 Affect Locomotion in Horses and Spinal Circuit Function in Mice," a paper published in *Nature* on August 30. The paper detailed he discovery of a naturally occurring genetic mutation in the domestic horse that likely alters the transmission of nerve signals in the spinal cord.
**HIV/AIDS research.** Dr. Pam Skinner, associate professor, VBS, and longtime collaborator Liz Connick, MD, professor in the University of Colorado School of Medicine Division of Infectious Diseases, were awarded a five-year research grant totaling more than $3.7 million from the NIH. Ultimately, the research could contribute to the development of a protective vaccine or cure for HIV-1, the most common and pathogenic strain of HIV (human immunodeficiency virus), the virus that causes AIDS.

**Biomedical research.** Research by Dr. Richard Isaacson, professor, VBS, and his team at the University of Minnesota and University of Illinois found that antimicrobial growth promoters administered to swine can alter the kind of bacteria present in the animal's intestinal track, resulting in an accelerated rate of growth and development in the animals.

**Lifetime Achievement Award.** Hill’s Pet Nutrition recognized Dr. Jody Lulich, professor, VCS, with the 2012 Mark L. Morris, Sr., Lifetime Achievement Award based on his significant achievements in nephrology, urology, education, and work with the Minnesota Urolith Center.

**Upper Midwest Agricultural Safety and Health Center.** The University of Minnesota was awarded $1.6 million a year for the next five years to fund the Upper Midwest Agricultural Safety and Health Center (UMASH). A collaboration of the University of Minnesota College of Veterinary Medicine, School of Public Health, National Farm Medicine Center of the Marshfield Clinic, and Minnesota Department of Health, UMASH is one of nine U.S. Centers of Excellence in Agricultural Disease and Injury Research, Education, and Prevention funded by the National Institute for Occupational Safety and Health.

**National Turkey Federation Research Award.** Dr. Kent Reed, professor, VBS, was presented with the National Turkey Federation Research Award at the annual meeting of the Poultry Science Association.

**Appointments to national advisory committee.** When Agriculture Secretary Tom Vilsack announced the members of the Secretary's Advisory Committee on Animal Health on December 9, 2010, they included two VPM faculty members: Dr. Elizabeth Wagstrom, associate professor, and Dr. Cindy Wolf, assistant clinical professor. Drs. Wagstrom and Wolf served two-year terms on the committee, which advised the Secretary of Agriculture on actions related to prevention, surveillance, and control of animal diseases of national importance.

**Poultry research award.** Dr. Kakambi Nagaraja, professor, VBS, received the Bruce W. Calnek Applied Poultry Research Achievement Award from the American Association of Avian Pathologists at the American Veterinary Medical Association Annual Convention in St. Louis.

**Five-year grant for Summer Scholars program.** The National Institutes of Health’s National Center for Research Resources awarded the College a five-year, $145,000 training grant for the project “Veterinary Summer Scholars in Comparative Medicine.” The grant is being used to expand the Summer Scholars training program and provide an eight-week summer research training experience for five DVM students each year. Thirty participating program faculty from across the University’s Academic Health Center are involved in training the students. The principal investigator on the training grant is Bruce Walcheck, professor, VBS.

**Award for excellence.** Dr. Jaime Modiano, Perlman Professor of Animal Oncology and director of the Animal Cancer Care and Research program, VCS, received the Asa Mays Excellence in Canine Health Research Award at the American Kennel Club Canine Health Foundation conference. The award is a biennial honor presented to research investigators who demonstrate meritorious advancements in furthering the mission of identifying, characterizing, and treating canine disease and ailments.

**Turkey genome sequence.** An international consortium of researchers, including Dr. Kent Reed, VBS, completed the majority of the genome sequence of the domesticated turkey. The sequence was published in *PLoS Biology,* a peer-reviewed open-access journal published by the Public Library of Science.

**Tata Chair in Veterinary Orthopedic Surgery.** Dr. Michael Conzemius, VCS, was appointed to the Tata Chair in Veterinary Orthopedic Surgery, which was established with a $3 million gift from the Tata Group, a worldwide business conglomerate based in India. The goals of the chair are to expand research and teaching in veterinary orthopedic surgery at the CVM and to improve veterinary care and education in India.
## General Rotation Evaluation

### 1. Knowledge: Knows how and willingness to show how

<table>
<thead>
<tr>
<th>Sources of Knowledge</th>
<th>A</th>
<th>Demonstrates excellent knowledge of scientific literature relevant to cases under his/her care and accurately interprets this information. Actively gathers specific and relevant information from a variety of sources (e.g., history/physical exam, use of tests and diagnostic modalities, selection of appropriate tests, gains case history needed for care in a timely fashion) to fully understand the problem.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Gathering/ Acquisition</td>
<td>F</td>
<td>Is often confused about where to look for sources to obtain knowledge and may not know how to use that knowledge in an astute manner. Seeks limited additional information to better understand problems; jumps to conclusions when gathering additional information is appropriate.</td>
</tr>
<tr>
<td>Basic Knowledge</td>
<td>A</td>
<td>Excels at demonstrating technical knowledge specific to the rotation and the application of clinical skills. Shows exceptional logic and knowledge in written interpretations and histories, case reports, discussion with faculty, and links observations from assessments to plans/discharge notes.</td>
</tr>
<tr>
<td>F</td>
<td>Fails to demonstrate technical knowledge specific to the rotation and the application of clinical skills. Has a basic understanding of what he/she knows and does not know. Presents only limited logic and knowledge in written interpretations and histories, case reports, discussion with faculty, and links observations from assessments to plans/discharge notes.</td>
<td></td>
</tr>
<tr>
<td>Species Knowledge</td>
<td>A</td>
<td>Demonstrates complete knowledge of species-specific information of species encountered in rotation (e.g. behavior, nutrition, handling, etc.).</td>
</tr>
<tr>
<td>F</td>
<td>Lacks knowledge of species-specific information of species encountered in rotation (e.g. behavior, nutrition, handling, etc.).</td>
<td></td>
</tr>
<tr>
<td>Disease Processes</td>
<td>A</td>
<td>Demonstrates complete knowledge of pathophysiology, etiology, epidemiology, immune response, etc. of diseases encountered in rotation.</td>
</tr>
<tr>
<td>F</td>
<td>Lacks knowledge of pathophysiology, etiology, epidemiology, immune response, etc. of diseases encountered in rotation.</td>
<td></td>
</tr>
</tbody>
</table>

**Rotation-Specific Material: Knowledge (Please Describe)**

**Comments:** (Please add any comments regarding student’s knowledge here.)

### 2. Clinical Skills: Applying the know-how in a practical setting

<table>
<thead>
<tr>
<th>History Taking</th>
<th>A</th>
<th>Demonstrates efficiency, thoroughness, and accuracy in performing a Hx. Demonstrates ability to ask questions that are systematic, relevant, precise, objective, non-leading, and interactive with respect to information obtained. Asks questions of clarification and corrects inconsistencies. Organizes historical information accurately in the medical record.</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Unable to gather Hx data in an efficient, thorough, accurate manner. Does not ask relevant questions. Uses leading questions. Does not ask questions of clarification. Unable to organize Hx info accurately in the medical record.</td>
<td></td>
</tr>
<tr>
<td>Physical Examination</td>
<td>A</td>
<td>Demonstrates proficiency in performing a complete physical examination with efficiency, thoroughness, and accuracy. Accurately identifies and records normal and abnormal findings.</td>
</tr>
<tr>
<td>F</td>
<td>Unable to perform a complete, thorough, accurate physical examination. Misses significant findings. Does not recognize normal and abnormal findings.</td>
<td></td>
</tr>
<tr>
<td>Clinical Decision Making (includes assessment of information)</td>
<td>A</td>
<td>Displays outstanding ability at integrating relevant information to make sound clinical judgments, e.g., information from Hx, PE, lab data, imaging data, production data, scientific literature, etc. Formulates a complete problem list, accurately prioritizes problems, and accurately determines differential diagnoses. Makes appropriate modifications in response to change in patient status. Takes economic considerations (e.g., cost implications of decisions, making wise choices that make sense in terms of treatment and cost) at a level appropriate for a senior student.</td>
</tr>
<tr>
<td>F</td>
<td>Fails to integrate important clinical information, resulting in poor clinical judgment, e.g. Hx, PE, lab data, imaging data, production data, scientific literature, etc. Unable to formulate a complete problem list, prioritize problems, and/or determine differential diagnoses. Does not make appropriate modifications as patient status changes. Fails to take economic considerations (e.g., cost implications of decisions, making wise choices that make sense in terms of treatment and cost) when making decisions.</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Plan</td>
<td>A</td>
<td>Devises excellent diagnostic plans based on a strong knowledge base. Provides superior explanation and rationale for the diagnostic plan; explains the diagnostic plan in the context of a specific patient.</td>
</tr>
<tr>
<td>F</td>
<td>Devises inadequate or incomplete diagnostic plans. Fails to provide clear explanation and rationale for the diagnostic plan; does not explain the diagnostic plan in the context of a specific patient.</td>
<td></td>
</tr>
</tbody>
</table>
| **Treatment Plan** | **A** Devises complete and accurate treatment plan. Provides superior explanation and rationale for the treatment plan; explains the treatment plan in the context of a specific patient.  
**F** Devises inappropriate or incomplete treatment plans. Fails to provide clear explanation and rationale for the treatment plan; does not explain the treatment plan in the context of a specific patient. |
|---|---|
| **Organization of Information** | **A** Organizes information in a very systematic manner (e.g., discharge notes, POMR, etc.).  
**F** Neglects to organize information in a reasonable manner. |
| **Procedures/Basic Clinical Skills** | **A** Demonstrates superior technical skills and is thorough and efficient in obtaining histories; performing physical exams; specialty examination skills, animal handling, and is adept at basic procedures (e.g., drawing blood, inserting catheters, tissue handling, use of basic instruments, use of aseptic techniques, etc.).  
**F** Demonstrates limited basic technical skills and is incomplete and inefficient at obtaining histories and performing physical exams, specialty examination skills, animal handling. Is not adept at basic procedures (e.g., drawing blood, inserting catheters, tissue handling, use of basic instruments, use of aseptic techniques, etc.). |
| **Patient Care and Welfare** | **A** Provides excellent patient/client care. Pays vigilant attention to details, such as patient’s comfort and nutrition. Ensures that treatments are done in a timely and accurate fashion. Readily recognizes changes in patient’s condition and communicates changes to supervising clinicians.  
**F** Provides substandard patient/client care. Does not consistently look after patient’s comfort. Does not consider patient’s nutritional care. Inconsistently administers treatments or provides inadequate treatment. Fails to recognize and report important changes in patient’s condition to supervising clinicians. |
| **Documentation and Written Communication** | **A** Prepares medical records in an accurate, timely, and efficient manner; adept at using the “system” to enter medical records. Puts great effort into clearly communicating and documenting discharge information. Consistently writes in a constructive and professional manner; adapts writing depending on the reader (e.g., other DVMs vs. client discharge records).  
**F** Tends to prepare medical records that are inaccurate/substandard, not timely, or not efficient; is not adept at using the “system” to enter medical records. Makes no particular effort to clearly communicate and document discharge information. Writes in an unclear, confusing manner that is hard to follow; fails to adapt writing depending on the reader (e.g., other DVMs vs. client discharge records). |
| **Rotation-Specific Material: Clinical Skills (Describe)** | **Comments:** (Add comments regarding student’s clinical skills here.) |
| **3. Professionalism:** | **Work habits, interpersonal maturity and skills, teamwork, commitment, initiative** |
| **Attendance and Punctuality** | **A** Is always present and on time (with the possible exception of a true, documented emergency). Always performs tasks in a timely fashion and meets deadlines.  
**F** Does not meet attendance guidelines on syllabus. Has more than the allowed number of absences for the rotation. Consistently comes late to sessions. Consistently misses deadlines. |
| **Initiative and Acceptance of Responsibility** | **A** Willingly takes responsibility and ownership for own action and their consequences (e.g., seeks feedback, willingly admits mistakes). Proactively follows up and follows through on case (pending data, response to treatment, etc.) Always responds to ethical dilemmas in accordance with AVMA and legal standards. Always readily assumes responsibility for equipment care and cleanliness. Cleans up after self.  
**F** Avoids responsibility for own actions and their consequences (e.g., deflects blame, does not admit mistakes, resists feedback). Fails to proactively follow up and follow through on case (pending data, response to treatment, etc.). Demonstrates behavior that is not in alignment with AVMA ethical standards and/or legal requirements. Consistently fails to assume responsibility for equipment care and cleanliness. Does not clean up after self. |
| **Teamwork, enthusiasm and Attitude Toward Work** | **A** Demonstrates excellent teamwork skills – works cooperatively with VMC personnel and client. Conveys an exceptional “can-do” spirit, a sense of optimism, ownership, commitment, and dedication.  
**F** Consistently demonstrates poor teamwork skills – does not work cooperatively with VMC personnel and client. Demonstrates a consistent sense of pessimism and/or lack of ownership, commitment, and dedication. |
| **Professional Appearance** | **A** Always dresses in a professional manner. Adheres to dress code. Exhibits excellent personal hygiene.  
**F** Exceeds commitments made to others (e.g., doctors, staff, clients). Frequently commits to things without following through, causing trust to be questioned. |
| **Verbally Communication** | **A** Displays excellent communication skills with clients, peers, faculty, and staff, including the ability to initiate communication, gather information, build relationships, give information, and close communication. Takes great care to demonstrate/communicate empathy and compassion.  
**F** Displays substandard communication skills with clients, peers, faculty, and staff. Has trouble initiating communication, gathering information, building relationships, giving information, or closing communication. Consistently deficient in demonstrating/communicating empathy and compassion. |
| **Rotation-Specific Materials: Professionalism (Please Describe)** | **Comments:** (Please add any comments regarding student’s professionalism here.)
LEARNING OBJECTIVES SUMMARY FOR CLINICAL COMPETENCIES

For each COE clinical competency, learning objectives from the core rotations have been summarized and the College competencies (from our Rotation Assessment Form - See Appendix 11-1) are listed in italics at the end of each rotation to which they primarily apply. Only objectives from the eight core clinical rotations (Anesthesiology (Anes), Large Animal Surgery (LAS), Large Animal Medicine (LAM), Necropsy (Nec), Public Health (PH), Radiology (Rad), Small Animal Medicine (SAM), and Small Animal Surgery (SAS)) have been listed. Many elective rotations also include these outcomes but are not included here; however, these outcomes are reflected as learning objectives on those rotations and students are expected to demonstrate competence in those rotations, as described in Standard 11 in the main body.

1) Comprehensive patient diagnosis (problem-solving skills), appropriate use of clinical laboratory testing, and record management
   a) (SAM, SAS, LAM, LAS) Students will demonstrate proficiency in history taking, asking appropriate questions, assessing information for accuracy and reliability, and asking questions of clarification to correct inconsistencies (History Taking)
   b) (SAM, SAS, LAM, LAS) Students will demonstrate proficiency in performing physical examination, give adequate emphasis to the purpose of the examination and to presenting complaints, as well as to evaluation of the other body systems, make accurate observations, and recognize abnormalities (Physical Examination)
   c) (SAM, SAS, LAM, LAS, Rad) Students will demonstrate knowledge and understanding of pathophysiology and diagnostic test results, and will be able to formulate and prioritize a problem list, establish a differential diagnosis, develop a diagnostic plan, and recommend an appropriate diagnostic approach (Clinical Decision Making)
   d) (SAM, SAS, LAM, LAS) Students will use the medical record system to accurately document each patient problem and write complete discharge notes in a timely manner (Documentation and Written Communication)

2) Comprehensive treatment planning including patient referral when indicated
   a) (SAM, SAS, LAM, LAS) Students will interpret and use case-related diagnostic test results to formulate the appropriate medical and/or surgical plan for each patient problem (Treatment Plan)
   b) (SAM, SAS, LAM, LAS) Students will document and communicate the daily treatments for their patients in a clear manner (Documentation and Written Communication)
   c) (SAM, SAS, LAM, LAS) Students will recognize and respond to changes in patient status, and recognize when problems warrant referral, as well as consider economic factors and withdrawal times (Clinical Decision Making)

3) Anesthesia and pain management, patient welfare
   a) (SAM, SAS, LAM, LAS, Anes) Students will recognize the need for pain management or anesthesia, define appropriate options and protocols for anesthesia/analgesia, and perform appropriate patient evaluation (Clinical Decision Making, Diagnostic Plan)
   b) (LAM, LAS, SAM, SAS) Students will develop a logical and coherent anesthetic plan for each patient, focusing on safety, cost, and other concerns and using a method that is humane and effective (Treatment Plan)
   c) (Anes, SAM, SAS, LAM, LAS) Students will effectively perform anesthetic procedures including general, local, and regional anesthesia, and provide monitoring and support of the patient (Procedures/Basic Clinical Skills)
   d) (SAM, SAS, LAM, LAS, Anes) Students will assess pain, use humane, effective methods of pain control, recognize when euthanasia is warranted, and use appropriate methods of euthanasia (Patient Care and Welfare)
   e) (SAM, SAS, LAM, LAS, Anes) Students will record SOAP information, including proposed anesthetic drug choices, doses, and volumes with adherence to legal requirements for controlled substances (Documentation and Written Communication)
4) Basic surgery skills, experience, and case management
   a) (SAS, LAS) Students will demonstrate knowledge of general surgical principles and lameness, pathophysiology, surgical procedures, and alternatives/modifications to standard procedures (Rotation-Specific Knowledge)
   b) (SAS, LAS) Students will identify appropriate surgical and physical procedures as diagnostic and/or therapeutic options, develop a list of possible complications subsequent to surgical intervention, and develop a plan for their management as well as the management of any other problems that may arise (Clinical Decision Making)
   c) (SAS, LAS) Students will perform physical and orthopedic/lameness examinations, surgical skills (aseptic technique, making an incision, atraumatic tissue handling, vessel ligation, suturing, etc.), and supportive and post-operative monitoring and care (Procedures/Basic Clinical Skills)
   d) (SAS, LAS) Students will present and discuss cases in a concise, complete, and well-organized fashion, and document the surgical procedures and treatment plan in the patient’s medical record (Documentation and Written Communication)
   e) (SAS, LAS) Students will proactively follow up and follow through on cases (pending data, response to treatment, etc.) and manage routine problems with minimal supervision (Initiative and Acceptance of Responsibility)
   f) (SAS, LAS) Students will work cooperatively with the client, referring veterinarian, faculty, staff, and students, and demonstrate willingness to seek and provide input to team members in a respectful way (Teamwork, Enthusiasm and Attitude Toward Work)
   g) (SAS, LAS) Students will provide timely service, client consideration, adherence to hospital policy, and willingness to spend the time needed to provide quality care (Work Ethic and Dependability)

5) Basic medicine skills, experience, and case management
   a) (SAM, LAM, LAS, SAS) Students will use test results to create and refine problem lists, formulate and update diagnostic plans, and make changes based on patient status (Clinical Decision Making)
   b) (SAM, LAM) Students will perform restraint and handling, venipuncture, administration of medications, and other routine procedures (Procedures/Basic Clinical Skills)
   c) (SAM, LAM) Students will document and discuss the procedures and treatment plan in the medical record (Documentation and Written Communication)
   d) (SAM, LAM) Students will proactively follow up and follow through on cases (pending data, response to treatment, etc.) and manage routine problems with minimal to no supervision (Initiative and Acceptance of Responsibility)
   e) (SAM, LAM) Students will work cooperatively with the client, referring veterinarian, faculty, staff, and other students (Teamwork, Enthusiasm and Attitude Toward Work)
   f) (SAM, LAM) Students will perform all required duties faithfully and punctually with attention to detail in patient management (Work Ethic and Dependability)

6) Emergency and intensive care case management
   a) (SAM, SAS, LAM, LAS) Students will prioritize problems, identify diagnostic and/or therapeutic options (including fluid therapy), list possible complications, and determine changes in patient status (Clinical Decision Making)
   b) (SAM, SAS, LAM, LAS) Students will demonstrate proficiency in procedures relevant to basic emergency care (point-of-care instrumentation, endotracheal intubation, stomach tube placement, etc.) consistent with prevailing ethical and legal constraints (Procedures/Basic Clinical Skills)
   c) (SAM, SAS, LAM, LAS) Students will use methods of restraint to minimize discomfort and risk of additional injury to the patient and to assure staff safety, and will adapt in response to changing needs of the patient (Patient Care and Welfare)
   d) (SAM, SAS, LAM, LAS) Students will communicate monitoring parameters for individual critical patients to hospital staff (Documentation and Written Communication)
   e) (SAM, SAS, LAM, LAS) Students will demonstrate the ability to manage routine problems with minimal to no supervision (Initiative and Acceptance of Responsibility)
   f) (SAM, SAS, LAM, LAS) Students will manage emergency situations effectively (Work Ethic and Dependability)
7) **Health promotion, disease prevention/biosecurity, zoonosis, and food safety**
   a) (PH) Students will demonstrate appropriate knowledge of occupational health issues, infection control/biosecurity, zoonoses, food safety, legal, regulatory, and current issues in public health (such as antimicrobial resistance, environmental health, disaster preparedness) *(Public Health Knowledge)*
   b) (PH) Students will formulate biosecurity, food safety, and disease prevention plans as well as communicate and consult with individuals and appropriate agencies *(Public Health Skills)*
   c) (LAM, LAS) Students will demonstrate appropriate knowledge of drug withdrawal times *(Rotation-Specific Material – Knowledge)*
   d) (SAM, SAS, LAM, LAS) Students will handle animals with potentially infectious diseases in an appropriate manner to prevent infection of other patients or humans, demonstrate knowledge of biosecurity, recognize cases with zoonotic potential, and provide effective measure of infection control and isolation *(Disease Processes)*
   e) (Nec) Students will perform a complete necropsy, including gross dissection, and collection and submission of appropriate samples for histopathology and further diagnostic testing, and will write a complete necropsy report *(Written Communication and Necropsy Knowledge)*

8) **Client communications and ethical conduct**
   a) (SAM, SAS, LAM, LAS, Anes, Rad, PH) Students will communicate effectively with clients, referring DVMs, and the in-hospital health-care team, write complete medical records, and observe and maintain ethical and legal regulations when using controlled drugs and/or writing prescriptions *(Documentation and Written Communication)*
   b) (SAM, SAS, LAM, LAS, Anes, Rad, PH) Students will willingly take responsibility and ownership for actions and their consequences, proactively follow up and follow through on cases, and respond to ethical dilemmas commonly posed to a veterinarian in a manner in accordance with AVMA and legal recommendations for ethical conduct *(Initiative and Acceptance of Responsibility)*
   c) (SAM, SAS, LAM, LAS, Anes, Rad, PH) Students will communicate in a manner consistent with the client’s ability to understand them, and in a professional and compassionate manner *(Verbal Communication)*

9) **Critical analysis of new information and research findings relevant to veterinary medicine**
   a) (SAM, SAS, LAM, LAS) Students will critically evaluate, interpret, and discuss the scientific literature during case discussions and support clinical trials in the VMCC *(Sources of Knowledge, Data Gathering/ Acquisition)*
   b) (SAM, SAS, LAM, LAS) Students will defend recommendations for diagnostic plans based on sound scientific principles *(Diagnostic Plan)*
   c) (SAM, SAS, LAM, LAS) Students will defend recommendations for treatment plans based on sound scientific principles *(Treatment Plan)*