It’s a new way of learning for students in the College of Veterinary Medicine freshman class. In the past, students would listen to a lecture and then wait in line for a brief opportunity to practice a clinical skill on a cadaver or their personal pet. Now, with a new curriculum introduced to last year’s first-years, students are getting the opportunity to practice clinical skills as much as they like.

The revamped Clinical Skills class, for example, features a variety of online “how-to” videos. Students are able to practice these skills on a nonbiological model as many times as they want to become proficient in a competency the vast majority of them will use countless times during their careers as veterinarians. Veterinary models are also becoming more readily available and as students have discovered they are infinitely more patient than pets.

The Clinical Skills class is part of a new, more-integrated curriculum that will be rolled out during the 2015-16 school year. A tweaked fourth-year
For the past four years, in addition to their regular duties, members of the Curriculum Review Board have spent countless hours reviewing, revamping, and implementing a new curriculum for the College of Veterinary Medicine.

“The Curriculum Review Board was magnificent,” says Dr. Peggy Root. “We were seven people with diverse fields of study, as well as diverse ideas on how to do a review and what the new curriculum should look like, but it was a very productive group.”

The curriculum revision is far from over, though. The collegiate curriculum committee is carefully monitoring the implementation of the new curriculum and will make adjustments when necessary.

Members of the CRB:

Dr. Peggy Root, facilitator
Dr. Dave Brown, Veterinary and Biomedical Sciences Department
Dr. Mike Conzemius, Veterinary Clinical Sciences Department
Dr. Dan Feeney, Veterinary Clinical Sciences Department
Dr. John Fetrow, Veterinary Population Medicine Department
Dr. Erin Malone, Veterinary Population Medicine Department
Dr. Jim Mickelson, Veterinary and Biomedical Sciences Department

curriculum was introduced in 2012-13, and the first-year curriculum was launched for the class of 2017.

“The buzz on the street is that first-year students have gone from being afraid they were the guinea pigs to being envied by the second- and third-year classes,” says Dr. Peggy Root, assistant dean of education and facilitator of the Curriculum Review Board (CRB). The CRB developed the new curriculum after gathering significant input from students, graduates, area practitioners, veterinary colleges, and other health professional schools.

The path that led to the college’s new curriculum began in 2009, when the University of Minnesota’s Blue Ribbon Panel asked each college to convene its own team to determine what it should do more of, what it should do less of, and what it should eliminate to improve efficiency and increase cost savings while retaining or improving the effectiveness and quality of their programs.

The American Association of Veterinary Medicine’s Council on Education requires all veterinary schools to develop relevant measures and provide evidence that all graduating students attain core competencies. To continue to deliver up-to-date, efficient, and state-of-the-art learning to students year after year, veterinary and other schools must periodically review and revamp their curriculums. In March 2013, the Council on Education went even further when it announced a new mandate that veterinary colleges review their curriculum every seven years.

“We embarked on our recent review because it was time,” says
Laura Molgaard, associate dean for academic and student affairs, who was hired in 1997 to implement what was then a new curriculum for incoming freshmen. “It is best practice to undertake a review periodically and redesign the curriculum if needed.”

Eliminating bloat and drift

“One might say that what happened to the old curriculum over its 16-year life span was too much of a good thing,” says Molgaard. Those in charge of school curriculums refer to it as “bloat” and “drift.” Bloat, or expansion, occurs when a curriculum expands through additional courses or additions to courses without a coinciding reduction in content. Drift occurs when the overall curriculum moves away from demonstrated goals because of changes that have occurred over time in individual courses. In 2011, the CRB was set up to rectify expansion and drift and to identify efficiencies in faculty effort and resources.

“We started with a needs assessment,” says Root. “The needs assessment included the creation of a blog to get discussion started and encourage input.” The CRB also established an input wall—multiple sheets of paper mounted to a wall—where the CRB could provide information and raise questions and faculty, staff, and students could provide feedback. Twice a month for three years, members of the CRB met to determine what content and courses would remain, which would be combined, and which would be eliminated. Department chairs and faculty were welcome to attend. The committee also held larger town hall meetings that were open to everyone.

“We used a backwards design model for the new curriculum,” says Root. “We looked at the fourth year first to see where we were and where we wanted to be, and then we determined the best way to get there. Fourth-year curriculum was only tweaked, which was very encouraging for the review board to come to the conclusion that our process was working.”

The board’s first major decision was whether to create a curriculum based on organ systems or one with an integrated approach in which students learn related competencies simultaneously to achieve an end point. The old curriculum originally was system-based, but it had drifted toward being a quasi-integrated curriculum. The board decided on a more streamlined, integrated curriculum that redefined what content was core and reorganized that content into fewer classes with less lecture time and more time for hands-on learning.

“We increased the number of laboratory opportunities and decided what we did not need to teach anymore,” says Dr. Erin Malone, professor of large animal surgery and member of the CRB. “For example, a highly functional anesthesia team and board-certified surgeon are needed for optimum outcomes with colic surgery on horses. Why teach colic surgery when most veterinarians won’t be doing it? I need to spend more time teaching students to do the things they are going to do on an everyday basis.”

Making learning active

Malone says the new curriculum meets three teaching goals. First, by eliminating bloat and drift, it creates new opportunities for active learning. While active learning is difficult to define, it is different from conventional modes of instruction in which teachers mostly lecture and students remain passive receptacles for data.

Current data from research conducted at the University of Minnesota’s Office of Information Technology shows learning improves when students play a more active role, that active learning classes contribute significantly to learning concepts, and that the teaching space matters. According to these studies, students in active learning classrooms outperformed their expected grades based on what their ACT tests would indicate, says Deborah Wingert, director of educational development for the college. Wingert works with faculty members to help develop active learning techniques.

For example, the jigsaw technique occurs when a class is broken into small groups of, say, six students. Each group looks at a different
real-life scenario such as identifying a parasite and then choosing a treatment. Once the group has completed its task, the six students split up, each going to a different small group. The new small groups thus consist of one student from each of the previous groups, which means each student brings a task to present to the other students in the group.

“The teacher is not lecturing. The students are teaching each other,” says Wingert. “Think, pair, and share is another simple, active learning technique, where the professor might lecture on a subject for 10 minutes, then ask a question. Students are given a brief time to ponder their answer before they pair up with a classmate to discuss and share answers.”

While the College of Veterinary Medicine has been integrating active learning into its curriculum for more than a decade, two new classrooms designed for the new curriculum present opportunities for even more of these sessions.

A former study hall in the Animal Science/Veterinary Medicine building was converted into a new active learning classroom, with 17 bullet-shaped tables all facing the center of the room.

“Students bring their own laptops, but there are two screens on each table, one facing the students and one facing the instructor in the middle of the room,” notes Malone. “The instructor can monitor how the student sessions are progressing.”

Each small group of students working independently can decide when and what they want to share with the class. For instance, in the new Microscopic Anatomy class, a group of students might decide to display on their screen a slide of cardiac muscle cells or astrocytes. Once the cells are projected onto the small group’s screen, the instructor can determine whether they will be shared with the entire class by projecting the image onto a larger, central screen.

In the surgery laboratory, a wall was removed to accommodate twice the number of students. The room is also equipped with the newest technologies, including a camera located in an overhead surgical light that can be used to project images of a surgery onto a main screen or even onto the students’ personal laptops.

“The students don’t all have to be scrunched around one table anymore,” says Curt Knutson, manager of experimental surgery and teaching laboratories. “They can now watch the surgery on a monitor.” At the same time, though, the surgeon instructors are in the room, available to answer whatever questions arise.

The second teaching goal of the new curriculum was that it needed to be cost-effective by optimizing the faculty’s time. For example, a course Malone taught in the old curriculum, Equine Limb Anatomy, was discontinued. Portions of the elective were incorporated into the core anatomy course, enabling her
Over the new four-year curriculum, lecture time will decrease by 21 percent while laboratory contact time will increase by 10.8 percent.

to reach more students. The other material is still being scrutinized to determine whether it will be redundant in the new curriculum.

The board also wanted to make sure that students had enough time in their schedule to actually assimilate and learn newly presented material. The two new Clinical Skills laboratories illustrate how the CRB accomplished all three goals—active learning, cost reduction, and more independent study time for students—in one course.

In the new course, instead of listening to a lecture, students watch “how-to” videos, many of them created at the College of Veterinary Medicine, prior to attending lab. They can watch each video as often as they like until they feel comfortable with the material. Models, some produced commercially and purchased by the college and others made by faculty members, now replace cadaver dogs, which were becoming pricier and more difficult to find.

Because many of the models are made from nonbiological materials—such as Penrose drains filled with water that’s been dyed red and placed neatly inside a replica of a dog’s leg—they can be used over and over.

“With cadavers, we had a two- to three-hour window,” says Malone. “And we would have to rotate 50 to 100 students through the laboratory. Each student had a limited time to practice in that one laboratory session.” Now, students have more independent study time and can practice their blood draws more frequently and in a more relaxed atmosphere.

Chicken thighs filled with mayonnaise-filled balloons make a perfect model for a pus-filled abscess. In early April, Root made 60 abscess models for a large third-year laboratory. Models are also being used in the “old curriculum” for student practice. When developing the new curriculum, the CRB’s goals also included keeping lecture time, including small group work, to 20 hours per week; increasing laboratory time to 15 to 20 hours per week; and increasing independent study time. Over the new four-year curriculum, lecture time will decrease by 21 percent from 2,764 hours to 2,182 hours, while laboratory contact time will increase by 10.8 percent, from an average of 7.4 hours to 8.2 hours a week.

Perhaps the best news of all for students, however, is that there are fewer tests. Because small discipline-based courses are now a part of larger courses, there is more hands-on learning, and more time to practice between classes what is learned in class.

Highlights of the NEW CURRICULUM

Many small changes, as well as some major ones, were made to the curriculum. Highlights include:

• Anatomy increased from one semester to two.
• Histology and Organology were consolidated into Microscopic Anatomy.
• Biochemistry now contains Genetics and Nutrition.
• Physiology increased from one semester to two, and information on Neurobiology and Reproductive Biology, two formerly separate courses, was added.
• Professional Development and Animal Populations were reconfigured.
• A new, two-semester course, Agents of Disease, combined the old-curriculum courses of Bacteriology, Virology, and Parasitology.
• Pharmacology and Toxicology were consolidated into one course.
• Disciple-based courses were consolidated into larger medicine, surgery, and specialty courses.
• Veterinary imaging was integrated with medicine and surgery courses.
• A first-year Preventive Medicine course was added.
• The bacteriology laboratory was replaced with a comprehensive diagnostics lab.