DVM Capstone Examinations
Updated April 2018

• Though the Capstone examinations are not courses, are pass/fail, and do not appear on the transcript, **passing each Capstone examination is necessary for program progression.**
• This is an overview of all three Capstone exams. Specific details about each exam will be provided prior to those exams.

**Goals**

**Application of material:** Studying for the Capstone provides opportunity to apply material learned to novel scenarios; the examination should assess this ability.

**Assessment of students:** The Capstone examinations should be used to ensure that all students who progress in the program have a mastery of key concepts, and the ability to integrate and apply information from the previous year. Students should be able to use the Capstones to identify deficits in knowledge or clinical reasoning abilities.

**Integration of material, faculty:** Faculty should use the Capstones as a tool for integrating their material with other classes in the same year, and within the same discipline across years.

**Integration of material, students:** Preparing for and completing the Capstone examinations should encourage students to integrate material across classes.

**Review of material from the previous year:** Studying for the Capstone should ensure that students have reviewed important facts and concepts from the previous year, to optimize preparedness for learning new material.

**Assessment of curriculum:** The Capstone exams should be used to track the performance of students as a whole in specific subject areas, disciplines and competencies, both within individual years and courses, and longitudinally throughout the curriculum. This analysis will be used to improve our curriculum in subsequent years.

**Overview and Schedule**

Capstone I refers to the exam that covers the first year of the curriculum. Capstone II refers to the exam that covers the second year of the curriculum, and Capstone III covers the third year of the curriculum with the expectation that at the time of Capstone III, students will have mastered knowledge covering all three years.

There are four types of capstone exams: online, open resource; in-class, closed book; online, closed book, progressive cases; and practical/hands-on skills tests. The constituents of each capstone exam are as follows.

<table>
<thead>
<tr>
<th></th>
<th>Online open resource exam</th>
<th>Closed book in-class exam</th>
<th>Online, closed book, progressive cases</th>
<th>Laboratory/OSCEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capstone I</td>
<td>Yes</td>
<td>Yes First day of class 2(^{nd}) year</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Available Friday June 1\(^{st}\), due by midnight on the Friday before classes begin (i.e.
Capstone I and Capstone II begin in June after the spring semester has been completed. They begin with an open resource, online exam that consists of a series of cases. The cases are written collaboratively by the Capstone Committee together with invited faculty with the relevant expertise for each case. Questions range from factual recall of material presented in the previous year, to the presentation of novel concepts and information that will require use of outside resources.

Capstones I and II conclude with an in-class, closed book exam given on the first day of class. This exam consists of 100 – 150 questions written by individual faculty, and reviewed by the Capstone Committee. Capstone II also includes a practical examination on the first day of class, based on VM737 Principles of Anesthesia. Additional information about this exam is found on the Capstone II Canvas site and will be distributed prior to the end of the preceding spring semester.

Capstone III consists of a series of online, closed book, progressive cases designed to replicate typical patient workups. Students make decisions about diagnostic tests and treatments, and once they have made that decision, they move to the next stage of the case. Students are required to take three groups of cases: one covering case material from fall courses VM728, VM749, and VM753, and two track selective exams. Capstone III also includes OSCEs.

**Exam Coverage**

This table indicates which courses will be covered on each section of each Capstone. Elective courses are not included in the capstone exams.

For the closed-book exams (Capstone I and II) and the practical exam (Capstone III), the number of questions derived from each course is roughly, but not exactly, proportional to the credits of that class. For Capstone III, small animal trackers will take two small animal exams, large animal trackers will take the food animal and equine exams, and general trackers will be able to choose which two exams they take. **Although the focus of the material in Capstone III is on the courses listed below, at this point in your education you will be expected to integrate all aspects of a case, including laboratory results, imaging, cytology, diagnosis, treatment, etc.**
<table>
<thead>
<tr>
<th>Capstone</th>
<th>Online Open Resource</th>
<th>Closed Book In-Class Exam</th>
<th>On-line, Closed-book, Progressive Cases</th>
<th>Laboratory/OSCEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>All required classes including Foundations VM710</td>
<td>All required classes except Foundations VM710</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>II</td>
<td>All required classes including Foundations (VM710)</td>
<td>All required classes except Foundations (VM710)</td>
<td>N/A</td>
<td>Practical: Anesthesia (VM737)</td>
</tr>
<tr>
<td>III</td>
<td>N/A</td>
<td>N/A</td>
<td>All required courses and required track-selective courses</td>
<td>OSCEs: Core junior practicu rotations</td>
</tr>
</tbody>
</table>

**Exam Logistics**

**Online Open Resource Exams**
These exams open on Canvas June 1 and are available all summer. They consist of cases with a series of questions. They may be progressive (the student only sees one question at a time and needs to submit the answer before seeing the next question) or in an all-questions-at-once format. Students may use any resources to answer questions, including classmates who have not yet finished that case, veterinarians, books, notes, and online resources. Please note that non-scientifically peer reviewed resources (including Wikipedia, VIN) are good starting places, but unless the answer can be verified using a scientifically peer reviewed resource (textbooks, PubMed), it may be incorrect. Within the availability period, students may enter and exit the exams as many times as they like. All exams must be submitted by midnight on the Friday before classes begin. It is each student’s responsibility to ensure that cases are submitted prior to the deadline. No extensions will be given for any reason, so students are encouraged to start early!

Each student’s results and feedback will be visible when the exam is submitted. Therefore, although students may work with classmates, it is a violation of the honor code to have one classmate submit the case and transmit the answers to other students.

**Closed Book In-Class Exam**
As noted, these exams are administered on the first day of class (Capstone I on the first day of Year 2, Capstone II on the first day of Year 3). All students MUST arrive for the exam at 9 a.m. The exam is multiple choice and scantron graded. There will be approximately 100 - 150 questions. Some of the questions will be case-based, and some will include printed images.

**Online, Closed Book, Progressive Cases**
Progressive cases derived from materials presented in Clinical Sciences III (VM749), Clinical Sciences IV (VM753), and Principles of Imaging II (VM728) are required for all students and include food animal, equine and small animal species. Each track-selective course is tied to a series of progressive cases that are species-specific. As noted, depending on chose track, students must complete two of the four track-selective case series associated with the following: Herd Management (VM757), Equine Medicine and Surgery (VM763), Small Animal Medicine and Surgery I (VM773), Small Animal Medicine and Surgery II (VM774). Students will complete all cases during randomly-assigned 4-hour sessions from 7:30 AM to 1:00 PM during the last week of third year classes.

**Practical Examinations and OSCEs**
As part of Capstone II, at the start of Year 3, there will be multiple choice questions and a practical examination related to VM 737 Principles of Anesthesia. Students will receive detailed information about this exercise prior to the end of the preceding spring semester.

OSCEs are skills-based tests (e.g. suturing, microscope use for diagnosis). Students are individually rated by a faculty/staff observer as they perform each required skill. The skills assessed are those acquired during the core junior practicum rotations: Anesthesia, Diagnostic Veterinary Parasitology, Communications, Clinical Pathology, Surgical Principles Laboratory, Small Animal and Large Animal Procedures Laboratory, and Radiology (Capstone III). For Capstone III, specific areas to be tested will be provided prior to April 1st of the third year. Students will sign up for time slots on Monday through Friday from 7:30 AM to 1:00 PM during the last week of classes for third year students.

**Grading Policies**

**Procedures for removing questions from in-class and online, open-resource exams (Capstone I and II)**

- If greater than 50% of the students answer a question correctly, the question remains.
- If 30 – 50% of the students answer correctly, the question remains if the biserial correlation is > 0.2.
- If fewer than 30% of the students answer correctly, the question is removed.

**Passing Grades**

A passing grade for the open resource sections of Capstones I and II is 80%. A passing grade for the in-class portions of Capstones I and II is 70%. To pass Capstone III, students are required to earn a minimum of 70% on each of the three components of the exam (the general exam based on fall courses and the two Track Selective exams). To pass the VM737 Practical Exam, students must pass four out of the five stations. OSCEs are graded as strong pass, weak pass, weak fail, and strong fail. Students must achieve a weak or strong pass at each of the OSCE stations. Students earning a weak fail or strong fail for any station must remediate that station.

**Remediation**

If a student receives less than 70% on the in-class portions of Capstones I/II or the on-line progressive cases of Capstone III, or 80% on the online open resource exams, he/she will have the opportunity to remediate (this is in distinction from regular VM courses, where receipt of an “F” grade precludes remediation). **Remediation for all sections of the capstone series is another exam in the same format.** For Capstones I and II, remediation for the in-class exam is administered on the Monday after Thanksgiving break.

To remediate Capstone III, the student will work through 2 additional cases presented in the same format 2-3 weeks following the regularly scheduled Capstone III. A student who is scheduled to remediate will be allowed to start senior rotations, but may request that a rotation be rescheduled, or that vacation be scheduled, during the week of the case remediation. Every effort will be made to accommodate such a request. **The student will also have an additional week(s) of clinics added to the senior schedule corresponding with the cases topics failed (e.g. neurology, medicine, cardiology, field service, etc.).** One week prior to the scheduled Capstone III remediation exam, the student will receive the signalment and presenting complaint for the case(s) so that he/she may better focus studying. The cases may or may not correspond to the specific topics covered within the original capstone case.

To remediate the practical examination associated with VM 737 Principles of Anesthesia, students must successfully complete an online Anesthesia case. To remediate the OSCEs associated with Capstone III, students must repeat the station on the Monday or Tuesday of finals week. Students who do not pass the
practical or OSCE remediation will meet with the Capstone Coordinator and the Associate Dean for Veterinary Academic and Student Affairs.

Students remediating Capstone I or Capstone II will be given one opportunity to review their original exam in a proctored environment. They will also be given one opportunity to re-take the original exam as practice. The time for this retake is flexible, dependent on faculty schedules, but should occur close to the remediation exam. Students failing the remediation will be given one opportunity to review the remediation exam in a proctored environment.

Students who do not satisfactorily complete the remediation exercise by achieving a 70% on an in-class exam or 80% on an online exam by the stated deadline for each semester will be subject to academic dismissal.

Students who do not appear for the in-class exam, in the absence of a personal emergency as outlined below, or who fail to submit one or more of the online open-resource cases, will receive a failing grade and be subject to academic dismissal without the opportunity for remediation.

**Combined and Transfer students**
DVM/PhD students will take Capstones I and II with their entering class. This means that Capstone II will be taken on the first day of classes the fall after DVM/PhD students have left the DVM curriculum and are in the early graduate student phase of their program. While it would be ideal for DVM/PhD students to take the Capstone II exam immediately before entering their third veterinary school year, the timeline of the DVM/PhD program makes that impractical for many students who will be defending their dissertations late in the summer before re-entering the veterinary curriculum.

Students transferring into the CSU curriculum 6 weeks or more before the start of the semester will be required to take and pass the online Capstone I or II exam. They will be encouraged to take the in class Capstone I or II exam without penalty, in order to identify limitations. Students transferring into the CSU curriculum less than 6 weeks before the start of the semester will be encouraged to take both exams, but neither will be required. Students entering the Program as a 4th year student will be required to complete and pass Capstone III.

**Capstone Contact Information, and Asking Questions about Capstone**
If you are having technical issues with the summer, online exams, please contact Jay Oaks first (jay.oaks@colostate.edu). If he cannot fix the issue, he will pass the question along to members of the Capstone committee.

Faculty cannot respond to questions about the content of the summer exams, so students must work through those using allowable resources. You will have an opportunity to comment on the exam after you have turned it in, including comments about individual cases. It can be difficult to anticipate all potential correct short answers in the Canvas platform. All online answers will be reviewed during the summer to identify all correct answers. If you have questions about your particular answer, please wait until the exam is corrected as you may receive credit for an answer initially marked incorrect.

**Extensions and Personal Emergencies**
There are no extensions given for the CSI and CSII online, open-resource exams, no matter what the circumstances (so start early!). The in-class CS I and CS II exam is only offered on one day. The Capstone III exam, both progressive case and OSCE components, are offered over a single week. Accommodations for work and travel cannot be made. A decision to give an excused absence for a significant personal emergency
(e.g. death in the immediate family or personal hospitalization) that happens on the day of an in-class exam or during the week of Capstone III is made solely by the Associate Dean for Veterinary Academic and Student Affairs.