1 Course Details

1.1 Calendar Description

This course provides the general principles, pharmacologic basis, and practical applications of general and local anaesthesia in small and large animals. Other topics covered include fluid and acid-base imbalance and the prevention and treatment of surgical shock.

Pre-Requisites: All Phase 1 courses.
Co-Requisites: All Phase 2 courses.

1.2 Course Description

This course presents the general principles, pharmacologic basis, and practical applications of general and local anesthesia in small and large animals. Other topics covered include the prevention and treatment of fluid and acid-base imbalance and surgical shock, as well as pharmacological aspects of drugs used in the treatment of infection, seizures, behavioral disorders and disorders of the blood.

1.3 Timetable

Timetable is subject to change. Please see WebAdvisor for the latest information.

1.4 Final Exam

Exam time and location is subject to change. Please see WebAdvisor for the latest information.

2 Instructional Support

2.1 Instructional Support Team

Instructor: Alexa Bersenas
Email: bersenas@uoguelph.ca
3 Learning Resources

Course notes, video clips and other resources will be posted on the course website according to unit/topic. Individual instructors will do this in advance of their lectures or labs. Any supplemental information will be clearly noted.

Textbooks on veterinary anesthesiology and pharmacology may be purchased at the student’s discretion but are not required. Students should purchase a veterinary drug handbook of their choice.

For questions regarding academic consideration, continuation of study, academic misconduct, safety, confidentiality, and experiential learning involving use of animals, please refer to the appropriate Phase 2 web documents on the OVC website.

4 Learning Outcomes

This course is divided into units with these specific goals that will be provided with each lecture.
Units:

Pharmacology (Pharmacokinetics/Pharmacodynamics, Autonomic Pharmacology, Neuromuscular Pharmacology, Sedatives, Opioids, Anti-inflammatory, Local Anesthetics, Antimicrobials, Behaviour Modifying Drugs, Anticonvulsants)

Analgesia

Local anesthetic techniques (Large Animals, Small Animals)

Anesthetic equipment (Equipment, Circuits and Flows)

General Anesthesia (Inhalants, Injectables, Techniques, Applied Kinetics, Records, Monitoring, Large Animals, Small Animals)

Fluids (Fluid Therapy, Acid-Base, Shock)

Euthanasia

Special Cases and Management

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. **ANESTHESIA**
   1. Know the mechanism of action of sedatives, anesthetics, and analgesics
   2. Compare and contrast the actions, case applications, and adverse effects of drugs used for sedation, analgesia and general anesthesia in core healthy veterinary species by selecting the most appropriate anesthetic and analgesic protocols
   3. Describe the pathophysiological changes associated with general anesthesia and identify the approaches used to reduce the minor and major negative impacts of general anesthesia
   4. Describe the components of pain physiology, associated pain management pharmacology, and technical methods for general surgery
   5. Conduct the drug and fluid calculations in order to appropriately select and administer accordingly
   6. Describe the components of acid base physiology and interpret basic derangements
   7. Outline the components, list and assemble the parts of an inhalant anesthetic
machine, rebreathing equipment, endotracheal intubation, and intravenous catheterization supplies
8. Conduct endotracheal intubation, intravenous catheterization, anesthetic monitoring, local anesthetic techniques, and safe anesthetic recovery

2. PHARMACOLOGY OF NON-ANESTHETIC DRUGS

1. Know the beneficial effects, mechanisms of action, and main adverse effects of selected major classes of anticonvulsants, antimicrobial agents, and drugs used to treat behavioural and blood disorders

5 Teaching and Learning Activities

2020-2021 Schedule for Anesthesia Pharmacology VETM 3470

FALL SEMESTER

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<th>Module</th>
<th>Topic</th>
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<tr>
<td>1. Lecture 1</td>
<td>Introduction</td>
<td>Course Introduction</td>
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<tr>
<td>Hanna/Valverde</td>
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<tr>
<td>2. Lecture 2</td>
<td>PK/PD</td>
<td>PK/PD1</td>
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<td>Hanna</td>
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<td>3. Lecture 3</td>
<td>PK/PD</td>
<td>PK/PD2</td>
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<td>Hanna</td>
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</tr>
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<td>4. Lecture 4</td>
<td>PK/PD</td>
<td>PK/PD3</td>
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<td>Hanna</td>
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<td>5. Lecture 5</td>
<td>PK/PD</td>
<td>PK/PD4</td>
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<td>Hanna</td>
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</table>
6. Lecture 6  PK/PD  PK/PD5  Hanna
7. Lecture 7  PK/PD  PK/PD6  Hanna
8. Lecture 8  PK/PD  ADR1  Johnson
9. Lecture 9  PK/PD  ADR2  Johnson
10. Lecture 10  PK/PD  Pharmacy 1  Johnson
11. Lecture 11  PK/PD  Pharmacy 2  Johnson

THANKSGIVING AND STUDY BREAK

12. Lecture 12  Autonomic Pharm  Autonomic Pharm I  Johnson
13. Lecture 13  Autonomic Pharm  Autonomic Pharm 2  Johnson
14. Lecture 14  Autonomic Pharm  Autonomic Pharm 3  Johnson
15. Lecture 15  Anti-inflam  Anti-inflam Pharm 1 t  Hanna
16. Lecture 16  Anti-inflam  Anti-inflam Pharm 2
Hanna

17. Lecture 17  
Neuromusc Pharm  
NM blockers/relaxan

18. Lecture 18  
Sedation/Premed  
Sedatives

19. Lecture 19  
Sedation/Premed  
Sedatives 2

Formative Test #1 Up to and including “Sedatives 2” (13%)

20. Lecture 20  
Sedation/Premed  
Opioids

21. Lecture 21  
Sedation/Premed  
Preop

22. Lecture 22  
Sedation/Premed  
SA Premed

23. Lecture 23  
Sedation/Premed  
SA Premed

24. Lecture 24  
Sedation/Premed  
LA Sedatives

25. Lecture 25  
Analgesia  
Analgesia 1
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<th>Topic</th>
<th>Instructor</th>
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<td>26.</td>
<td>Valverde Analgesia</td>
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<tr>
<td>27.</td>
<td>Hanna Analgesia Local Pharmacol</td>
<td></td>
</tr>
<tr>
<td>1. Activity 1 Sedation/Premed</td>
<td>Sinclair</td>
<td></td>
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<tr>
<td>1. Activity 1 Sedation/Premed</td>
<td>Sinclair</td>
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<tr>
<td>1. Activity 1 Sedation/Premed</td>
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<td>28.</td>
<td>Valverde Analgesia Local</td>
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<td>29.</td>
<td>Valverde Analgesia</td>
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<tr>
<td>30.</td>
<td>Hanna General Anesthesia</td>
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<tr>
<td>31.</td>
<td>Valverde Anesth Equipment</td>
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</table>
32. Lecture 32  
2  Hanna  
General Anesthesia  IV Anesth Pharm

33. Lecture 33  
1  Valverde  
General Anesthesia  General Anesthesia

34. Lecture 34  
2  Valverde  
General Anesthesia  General Anesthesia

1. Laboratory 1  
Valverde  
Analgesia Local  Local Block Lab SA

35. Lecture 35  
3  Valverde  
General Anesthesia  General Anesthesia

36. Lecture 36  
Pharmacol  Hanna  
General Anesthesia  Inhalant

2. Laboratory 2  
Valverde  
Analgesia Local  Local Block Lab LA

37. Lecture 37  
Valverde  
Anesth Equipment  Circuits and Flows
### Formative Test #2 From Preop Evaluation up to and including “Circuits and Flows” (13%)

**WINTER SEMESTER**

<table>
<thead>
<tr>
<th>Lecture or Laboratory or Activity</th>
<th>Module</th>
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<tr>
<td>4. Laboratory 4 Circuits/Cath/Intub/Mix</td>
<td>Anesth Equipment</td>
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<tr>
<td>38. Lecture 38 Sinclair</td>
<td>Gen Anesth</td>
<td>Records/Monitoring</td>
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<tr>
<td>4. Laboratory 4 Circuits/Cath/Intub/Mix</td>
<td>Anesth Equipment</td>
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4. Laboratory 4
Circuits/Cath/Intub/Mix  Valverde  Anesth Equipment

39. Lecture 39
Monitors/Monitoring  Sinclair  General Anesthesia

4. Laboratory 4
Circuits/Cath/Intub/Mix  Valverde  Anesth Equipment

40. Lecture 40
Sinclair  General Anesthesia SA  SA Anesth 1

41. Lecture 41
Sinclair  General Anesthesia SA  SA Anesth 2

5. Laboratory 5
Valverde  General Anesthesia  SA Sed/GA Lab(C)

42. Lecture 42
Sinclair  General Anesthesia LA  LA Anesth 1

5. Laboratory 5
Valverde  General Anesthesia  SA Sed/GA Lab(A)

43. Lecture 43
Sinclair  General Anesthesia LA  LA Anesth 2

44. Lecture 44
Hanna  Antimicrobial Pharm  Antimicrobials 1
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<td>51</td>
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<td>Johnson</td>
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<td>Drugs re: Blood</td>
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<td>Johnson</td>
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53. Lecture 53  
    Johnson  
    Behaviour Mod Drug  
    Behav Mod Drug 2

54. Lecture 54  
    Hanna  
    Anticonvulsant Pharm  
    Anticonvulsants 1

55. Lecture 55  
    Hanna  
    Anticonvulsant Pharm  
    Anticonvulsants 2

**WINTER BREAK**

**Formative Test #3 From “Records/Monitoring” up to and including “Anticonvulsants 2” (13%)**

56. Lecture 56  
    Valverde  
    Fluids  
    Fluids 1

57. Lecture 57  
    Valverde  
    Fluids  
    Fluids 2

58. Lecture 58  
    Valverde  
    Acid-Base  
    Acid-Base 1

6.  
    Laboratory 6  
    Sedation/Analgesia  
    Valverde  
    LA

6.  
    Laboratory 6  
    Sedation/Locals  
    Valverde  
    LA

59. Lecture 59  
    Acid-Base  
    Acid-Base 2
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<td>Bersenas</td>
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<td>Euthanasia</td>
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<td>GA/Fluids</td>
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**Laboratory 6**

<table>
<thead>
<tr>
<th>Sedation/Locals</th>
<th>Instructor</th>
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**Activity 2**

<table>
<thead>
<tr>
<th>GA/Fluids</th>
<th>CBL Session 2</th>
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<tbody>
<tr>
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</table>
Sinclair

2. Activity 2
GA/Fluids
CBL Session 2

66. Lecture 66
Debrief Clinical Qs, Cases
Valverde

Formative Test #4 From “Fluids 1” up to and including “Special Cases- Other” (13%)

FINAL EXAM (40%): Refer to WebAdvisor for date and time.

6 Assessments
In order to pass the course, students must achieve an overall course grade (formative tests + CBL + final exam) of at least 50%, must achieve a grade of at least 50% on each section (Anesthesia and Pharmacology) of the final examination, and must successfully complete all laboratory activities.

6.1 Assessment Details
Formative Tests (52%)

4 Formative tests (FT): 52% of the course grade (13% each)

FT # 1-lecture From “Introduction” lecture, up to and including “Sedatives 2” lecture.

FT # 2-lecture From “Preop Evaluation” lecture, up to and including “Circuits and flows”

FT # 3-lecture From “Records/Monitoring” lecture, up to and including “Anticonvulsants 2”
Formative tests may include a variety of question formats, such as multiple choice questions and short essay questions.

For Academic Consideration, please contact the Associate Dean, Students and Academic (ovc.dvmacademics@uoguelph.ca). Students who miss a formative test for reasons approved by the Dean’s Office will be permitted to write a deferred test, which will be scheduled at the earliest possible date and will consist of essay questions.

Students who miss a formative test for reasons not approved by the Dean’s Office will be assigned a grade of zero for that test.

2 CBL Sessions (8%)

Laboratory Participation (0%)
Graded as Pass/Fail

**Attendance at all laboratories is MANDATORY**

Students who fail to complete one or more labs will be assigned a grade of incomplete (INC) and will be required to complete the laboratory during the summer in order to pass the course. Students who fail to complete the laboratories before the commencement of classes for Phase III of the DVM program will be deemed to have failed the course and will be assigned a final course grade of 49%.

**Final examination (40%)**

The final examination will be administered as scheduled in the Phase 2 timetable.

The exam weighting will be 60% for the Anesthesia lectures/labs and 40% for the Pharmacology lectures.

A grade of at least 50% must be obtained on each section (Anesthesia and Pharmacology) of the final exam, and consequently for the entire exam, to pass the course.

**In order to Pass VETM*3470 Anesthesiology & Pharmacology, students must achieve all of the following:**
• Passing grade for the course: 50%
• The student must achieve 50% on both sections (Anesthesiology + Pharmacology) of the final exam.
• A student who scores less than 50% on one or both sections (Anesthesia and/or Pharmacology) of the final examination (regardless of the overall exam grade), and/or whose overall grade for the course is less than 50%, will be deemed to have failed the course.
• The student is automatically eligible for a resit if their overall course grade is above 50% despite failing one section of the final exam. They will be assigned a grade of incomplete (INC) and will be required to write both sections on the resit regardless of which section they obtained their original failing grade in. The student must pass (with 50% on both sections) the conditional resit; if successful, their original final exam grade is kept and used to calculate the final course grade. If they are unsuccessful (receive less than 50% in one or both sections of the resit examination), a grade of 49% will be assigned and the student will fail VETM*3470 Anesthesiology & Pharmacology.
• The student must attend all lab sessions or have Academic Consideration to have missed a lab session - coordinators will determine what requirements they need to do in order to make up missed labs if Academic consideration is granted.

7 Course Statements

7.1 Administrative Information

For questions regarding academic consideration, continuation of study, academic misconduct, safety, confidentiality, and experiential learning involving use of animals, please refer to the appropriate Phase 2 web documents on the OVC website.

7.2 Required Safety Training

It is the responsibility of each student to fully review the COVID-19 safety plan on CourseLink for each in-person course activity in this course, and to adhere to all safety protocols that have been prescribed. As well, students must follow the steps below before coming to campus:
1. Complete the COVID-19 Infection Prevention and Control Awareness Training course via CourseLink.

2. **For every day that you have an in-person course activity**, before you come to campus, complete U of G's COVID-19 Screening Form. **Do not come to campus if the form indicates you should stay home.**

### 7.3 Statement on Session Recordings:

By enrolling in a course, unless explicitly stated and brought forward to their instructor, it is assumed that students agree to the possibility of being recorded during lecture, seminar or other "live" course activities, whether delivery is in-class or online/remote.

If a student prefers not to be distinguishable during a recording, they may:

1. turn off their camera
2. mute their microphone
3. edit their name (e.g., initials only) upon entry to each session
4. use the chat function to pose questions

Students who express to their instructor that they, or a reference to their name or person, do not wish to be recorded may discuss possible alternatives or accommodations with their instructor.

### 7.4 Netiquette Statement Regarding Online Behaviour:

Inappropriate online behaviour will not be tolerated. Examples of inappropriate online behaviour include:

- Posting inflammatory messages about your instructor or fellow students
- Using obscene or offensive language online
- Copying or presenting someone else's work as your own
- Adapting information from the Internet without using proper citations or references
- Buying or selling term papers or assignments
- Posting or selling course materials to course notes websites
- Having someone else complete your quiz or completing a quiz for/with another student
- Stating false claims about lost quiz answers or other assignment submissions
• Threatening or harassing a student or instructor online
• Discriminating against fellow students, instructors and/or TAs
• Using the course website to promote profit-driven products or services
• Attempting to compromise the security or functionality of the learning management system
• Sharing your user name and password
• Recording lectures without the permission of the instructor

8 University Statements

8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Graduate Calendar - Grounds for Academic Consideration
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions
https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml

8.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

Graduate Calendar - Registration Changes
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-regregchg.shtml
8.4 Copies of Out-of-class Assignments
Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

8.5 Accessibility
The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

For Guelph students, information can be found on the SAS website https://www.uoguelph.ca/sas

For Ridgetown students, information can be found on the Ridgetown SAS website https://www.ridgetownc.com/services/accessibilityservices.cfm

8.6 Academic Integrity
The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.
8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

8.8 Resources

The Academic Calendars are the source of information about the University of Guelph’s procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars
https://www.uoguelph.ca/academics/calendars

8.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings and academic schedules. Any such changes will be announced via CourseLink and/or class email. All University-wide decisions will be posted on the COVID-19 website (https://news.uoguelph.ca/2019-novel-coronavirus-information/) and circulated by email.

8.10 Illness

The University will not normally require verification of illness (doctor’s notes) for fall 2020 or winter 2021 semester courses. However, requests for Academic Consideration may still require medical documentation as appropriate.