

Syllabus

VBMS 3050 (2 credits) - Veterinary Medicine Study Abroad: Tropical Veterinary Science and the Great Barrier Reef

http://studyabroad.auburn.edu/?go=AU_Vet_Australia

Class type:	Study Abroad
College/School:	College of Veterinary Medicine
Program type:	Auburn University Faculty Led
Majors	(Recommended) Agriculture Honors, Preveterinary Medicine, Life - Science Related, Veterinary Medicine Related
Pre-Requisites	Auburn University and Non-Auburn University Undergraduate Junior or Senior; Professional Veterinary Medical, or Graduate student with a GPA 2.5+

Course Description To introduce students to the challenges of maintaining health in domestic, wild and commercial Australian land and marine animals through exposure to diverse ecological land and marine park environments

Faculty:	Dawn Boothe, DVM, PhD Professor Director, Clinical Pharmacology Dept. Anatomy, Physiology, Pharmacology College of Veterinary Medicine boothdm@auburn.edu Dr. Fred Nucifora Director, Reef Head Quarters Aquarium Townsville, North Queensland, Australia
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Lectures and field trips will be run by local experts in the field. Their expertise includes veterinarians, cattle ranchers, animal scientists, epidemiologists, aquarists, marine biologists, National Park Rangers, and local tour guides specializing in ecology and native flora and fauna. Additional discussion and input will be provided by the attending Auburn University faculty members to emphasize aspects of importance to veterinary medicine.

Credit hours: 2 Formal lectures = 22 hours; Discussions or hands on experiences will result in 60 in the field hours

Recommended Texts/Web sites: Guides to Australia's Great Barrier Reef, Northeast Australia's Tropical Forests, Guides to Flora and Fauna, and particularly Guides to Birds (esp The Michale Morcombe & Davis Steward eGuide to Australian Birds) are strongly recommended.

Grades: This course will be Pass/Fail. The grade will be based on attendance, collegiality and submission of an electronic journal that will require an entry for each activity.

The initial entry should be completed PRIOR to the first activity and should be handed in to Dr. Boothe on the first day of class. This will be the only “paper” activity. It should include your name, relevant background, your educational goals and, in regards to the trip, 3 personal goals/bucket list items. This first entry should be included in your electronic journal.

From that point on, each activity entry should include a brief overview of the activity from the student’s perspective (how did the student participate?) 3 “learning” issues. One to two students will be designated as the primary journalists for each activity.

The last entry should be submitted by all students and include a summary of at least 3 biases or surprising facts the student learned and assessment of each of the outcomes. This journal should be submitted within 30 days of completion of the trip.

The combined comments of the journal will be used as a basis for sharing with other students, faculty, and other participants the experiences from this class.

Program Overview:

This program has been developed in partnership with the Great Barrier Reef Marine Park Management and Reef Head Quarters Aquarium Turtle Hospital. of Townsville, North Queensland, Australia. The Marine Park will provide all resources necessary for the program. The Tropical Australia program includes 15 days full of activities that focus on the health and control of indigenous and introduced (including sport and food-producing) animal species.

The program will introduce students to various aspects of Australian native fauna, flora and domestic species. This includes care, handling and medical problems encountered in native animals (both wild and in a sanctuary environment); venomous animals (handling and treatment of envenomations in domestic animals); conservation issues in World Heritage rainforest and dry sclerophyll forests, endangered species conservation, management of introduced feral animals (cats, dogs, pigs, toads) by trapping and poisoning using 1080 baits; best farming practices- the beef industry, vaccinations and medical problems encountered in range cattle; aquaculture- shrimp and cobia production; hygiene, disease management, algae production, minimal use of antimicrobials, water hygiene and nutrient management strategies, human euthanasia of fish; visit to the Veterinary College at James Cook University: tours, lectures by faculty, clinical rotations, interactions with faculty and students. In addition, the course will focus on the Great Barrier Reef: its conservation and health (including a hands-on monitoring experience); a focus on diseases of turtles, coral and fish species identification, aquarium hygiene and diseases of captive aquatic species. Finally, a focus on diversity will include exposure to aboriginal culture and history. Food and, accommodations will be predominantly at the Townsville Great Barrier Reef Aquarium (sleep and swim with the fished!) but accommodations will include three nights in the heart of the tropical forest. Transportation is included. Two additional evenings and food allowance will be available at the Civic Guest house in Townsville before or after the program to allow the group to catch up and recover from jet lag without stress of finding accommodation.

Course Goals and Learning Outcomes

The course goal is to expose students to the challenges of balancing the management and maintenance of diverse fragile ecologic systems in an face of a growing human and accompanying agricultural animal populations.

Learning Outcomes: Upon completion of this course, students will be able to:

1. Describe the challenges to survival of the great barrier reef marine park;
2. Be able to implement a marine animal monitoring survey;
3. Relate the importance of both flora and fauna to health and disease (therapy and toxicity);
4. Describe the challenges and resolutions of beef herd management implemented over large ranges;
5. Identify the core organizers necessary for implementation of a rare-breed cattle insemination program;
6. Assess the benefits and risks associated with increasing human population growth in tropical forests and marine parks;
7. Describe the organization of a commercial aquaculture program from fertilization to food;
8. Delineate the medical challenges of a sanctuary;
9. Describe the field challenges of a conservancy; and
10. Relate the history of Australia to the challenges of flora and fauna management as an example of challenges in any nation

VBMS 3050 Tropical Veterinary Science and the Great Barrier Reef Schedule

Day 1: The Great Barrier Reef Marine Park Management & Reef HQ Aquarium Turtle Hospital
Welcome to Reef HQ Aquarium - Course overview Reef HQ Aquarium is the world's largest living coral reef aquarium and the Australian Government's National Education Centre for the Great Barrier Reef.
Introduction to the Great Barrier Reef Marine Park and its management. An ecosystem based approach is used, and the Great Barrier Reef Marine Park is widely recognised as one of the best managed marine protected areas in the world. The Marine Park is a multiple-use area that supports a range of communities and industries that depend on the Reef for recreation or their livelihoods. Tourism, fishing, boating and shipping are all legitimate uses of the Marine Park. The entire Marine Park is covered by a Zoning Plan that identifies where particular activities are permitted and where some are not permitted.
Behind the scenes tour of Reef HQ Aquarium, animal husbandry focus. The world's largest living coral reef aquarium! Go behind the scenes and explore what it takes to maintain a biological system of this size. During the behind the scenes tour, you will learn how Reef HQ Aquarium staff keep Reef HQ Aquarium's living exhibits healthy and how they monitor the conditions that are required to maintain a "Living Coral Reef on Land".

Reef HQ Aquarium Turtle Hospital operations presentation.

Reef HQ Aquarium's Turtle Hospital provides a dedicated facility, where sick and injured marine turtles can be cared for and rehabilitated. The hospital operates under and promotes the C.A.R.E (Conserve. Act. Rehabilitate. Educate) philosophy playing a key role in raising community awareness in relation to threatened species and encouraging behavioural change that will benefit the environment. During this truly inspirational experience students will learn more about marine turtles "the ancient mariners of the sea" and visit the Turtle Hospital where sick and injured marine turtles are being cared for.

Overnight at Reef HQ Aquarium

Day 2: Creature Feature Workshops and Reef Health Assessment Training.**Reef HQ Aquarium Creature Feature Workshop.**

The Discovery Lagoon is one of Reef HQ Aquarium's newest living exhibitions. It is home to an amazing array of reef creatures. Students will have a hands-on opportunity to interact with animals such as baby leopard sharks, rays, sea cucumbers and sea stars that inhabit Discovery Lagoon and call the Great Barrier Reef home. Using state-of-the-art technology you will also be able to look at the mouth of a sea star, the tube feet of sea urchins and examine a variety of other reef creatures up close.

Coral propagation program.

Based on the same techniques frequently used in domestic gardens to start new plants from cuttings off mature plants. Coral fragments "cuttings" are taken from donor colonies to start new colonies. This ensures Reef HQ's displays are maintained and developed in the most sustainable way. Sharing our secrets is also helping other facilities to reduce their ecological footprint.

Leopard shark captive breeding program.

Our leopard shark captive breeding program is internationally recognised. Reef HQ Aquarium is one of only a few aquariums worldwide that have eggs laid and new pups hatched successfully. Reef HQ donates offspring to other zoos and aquariums around Australia and the world which reduces the number of sharks collected from the wild. Growth rate research also helps environmental management agencies to better understand how to protect them.

Reef Health Assessment Training (Theory)

The Great Barrier Reef Marine Park Authority's "Rapid Monitoring Program" is the latest citizen science (community monitoring tool) that enables community members to participate in monitoring the health of the Great Barrier Reef. The strength of the program is that it can be used either at the same site repeatedly for monitoring changes over time or it can be deployed anywhere on coral reefs to get a snapshot of reef health. You will receive in-water training within Reef HQ Aquarium's Coral Reef Exhibition, instructed in the simplified steps and use of diagrams on underwater slates. The Rapid Monitoring Program can easily be adopted by people who may not have a scientific background however the data collected provides enough detail to be of scientific value for reef managers.

Reef Health Assessment Training (In water practical)

Put theory lessons into practice snorkelling in Coral Reef Exhibition at Reef HQ Aquarium. Conduct a Reef Health Assessment on the world's largest living coral reef aquarium in preparation for your day trip to the Great Barrier Reef.

Hands on Wildlife (Caring for wildlife and conservation).

Discover the secret lives of animals that can be found nowhere else on the planet. During your personal two hour wildlife experience, you will get to meet some of Australia’s most captivating creatures. The small group, and quiet setting of Reef HQ will allow you to get closer than ever before to our friendliest and even some of our deadliest animals. Touch, hold, and have your photo taken with some of Australia’s most iconic wildlife. You will also get to speak with experts in the animal care field to find out more about animal handling, restraint, and husbandry techniques.

We will explore what makes Australia’s native animals so special, and gain insight into why they have some of the most specialised adaptations in the world. Australia is a harsh environment and only the strong survive. We will examine some of the many threats that our native animals face and discuss why they sometimes end up with devoted wildlife carers. Find out what it takes to rescue and care for everything from macropods, to bats, to venomous snakes.

Overnight at Reef HQ Aquarium

Day 3: Day trip to the Great Barrier Reef to conduct reef health assessment in the field.

Board MV Adrenaline dive vessel

Day trip to the Great Barrier Reef, to conduct Reef Health Assessments in the field.

Snorkelling on the Great Barrier Reef.

Overnight at Reef HQ Aquarium

Day 4: James Cook University School of Biomedical and Veterinary Science site visit.

James Cook University’s Veterinary School is accredited by the Australasian Veterinary Board’s Council and the Royal College of Veterinary Surgeons. James Cook University is the only university north of Brisbane to offer veterinary science training. The School of Veterinary and Biomedical Science has extensive research expertise in tropical animal and veterinary science.

Facilities on the Townsville campus for veterinary science students include teaching laboratories, a range of livestock in paddocks and yards and small animal pens. Day visit with students and faculty of the School of Veterinary & Biomedical Sciences, James Cook University. The visit will consist of a campus tour (including fish and then lectures on arboviruses and Hendra virus and their associated morbidity and mortality in horses, veterinarians and horse trainers over the last 2 decades), and venomous snakes spiders, jellyfish and ticks. The afternoon will be spent “on clinics” with senior JCU students. Options for the clinics include small animal clinics or at a horse-racing facility, which includes a drug testing collection site. We will host the JCU students for dinner.

Site visit continues.

Dinner with JCU Faculty and Students (30 people Auburn and JCU)

Overnight at Reef HQ Aquarium

Day 5: World Heritage Tropical Rainforest & Platypus in the wild.

Hidden Valley Cabins is an Australian Tourism Award winning eco lodge located 1 ½ hours north west of Townsville. Hidden Valley Cabins unique location allows visiting educational groups to experience a number of different eco systems within a 50 km radius of the lodge. Whether it be a the mangrove eco systems on the coastal plains, Wet and Dry Sclerophyll Forests leading into the dense World Heritage Listed Wet Tropics Rainforest or the Dry Open Woodlands surrounding Hidden Valley Cabins the possibilities are endless. Hidden Valley Cabins was also recognised by Australian Geographic as one of the top five places to see Platypus in the wild. Daily guided tours insure Platypus sighting are above 98 per cent.

Rainforest hike - The World Heritage Listed Wet Tropics Rainforest area of North Queensland is considered to be amongst the oldest continual growing rainforests in the world and is a real time capsule of evolution of Australia's unique flora and fauna. It contains outstanding examples representing the major stages of the earth's evolutionary history and examples representing ongoing ecological and biological processes in the evolution and development of terrestrial ecosystems and communities of plants.

Platypus Tour – Hidden Valley is home to one of the only Monotremes in existence - The Platypus. You will travel down to Running River where the platypus can be viewed frolicking and feeding in the fresh mountain water. Your tour includes a personal guide.

Overnight at Hidden Valley Cabins.

Day 6: Australian Wildlife Conservancy (AWC) - Service Learning Activity.

Australian Wildlife Conservancy acquires land, and works with other landholders, to establish sanctuaries for the conservation of threatened wildlife and ecosystems. Australian Wildlife Conservancy now owns 23 sanctuaries covering over 3 million ha (7.4 million acres) in places such as north Queensland, the Kimberley, western New South Wales, Northern Territory and the forests of south western Australia. Australian Wildlife Conservancy's Mt Zero-Taravale Sanctuary is located on the western side of the Paluma Range National Park. Reserve manager Tim White will showcase Australian Wildlife Conservancy land management, rehabilitation programs, wildlife mapping and conservation and explain how Australian Wildlife Conservancy continues to build on a strong base of investments with Australia.

Learn from the AWC on how the organisation implementing practical, on-ground conservation programs. AWC is distinguished by its extraordinary commitment to the implementation of practical, on-ground conservation programs. Over 80 per cent of AWC's staff are based in the field where they implement programs including feral animal control, weed eradication, fire management and translocation of threatened species. A commitment to such programs is critical if the biodiversity on AWC sanctuaries is to be effectively protected.

Overnight at Hidden Valley Cabins.

Day 7: Spyglass Beef Research Station.

Full day technical visit to the new purpose-designed facility that will play a leading role in research and training to advance tropical and subtropical beef production and ecosystem management. These are vital for the future profitability and sustainability of Queensland's beef industry, which currently earns \$4.5 billion annually.

Overnight at Hidden Valley Cabins.

Day 8: The medicinal value of tropical rainforest plants from Paluma, North Queensland, Australia.

A pharmacological survey of flora of the Paluma rainforest including 90 species representing 19 families has been carried out. Crude plant extracts have been screened for cytotoxic, antibacterial, antifungal, and antiviral activity, as well as brine shrimp lethality. Of these, 27 extracts exhibited remarkable cytotoxic activity, 23 showed antimicrobial activity, and 7 showed promising antiviral activity. Thus, 53 of the plant species examined showed marked bioactivity in one or more bioassays; a "hit rate" of 59%. These results underscore the phytomedicinal potential of Australian tropical rainforests.

An afternoon with the researcher and exploring the rainforest.

Overnight at Hidden Valley Cabins.

Day 9: Mungulla Station - Aboriginal Culture, Sea Country and wetlands Rehabilitation Project.

Visit Jacob Cassidy and his family of the Nywaigi Aboriginal people at Mungulla Station, a beef cattle property. Learn about their lives and country prior to European settlement, their conflicts with the early settlers and the subsequent effects on their environment.

The story continues through to today where the Nywaigi people are running Mungalla Station and working with various organisations to restore damaged wetlands and waterways to their once pristine state.

Overnight at Billabong Sanctuary

Day 10: Billabong Sanctuary - Australian Wildlife Park: Terrestrial Vet Science Experience Program.

Join the veterinary team on a tour showing practical examples of animal disease control, animal production, animal inspections and quarantine measures, research and monitoring some of Australia's most critically endangered and unique species found in the far north. Our team of veterinarians are through the JCU vet science programme and are hands on with students studying this field.

An integrated day of learning with leading veterinarian's in this field blended with a hands on animal experience with our rangers in charge of Australian reptiles, mammals and birds

Specialty presentations including venomous snake displays, Cassowary's, koala, wombat and crocodile presentations to expose students to Australian native animals.

Join veterinary team for a total 2 hour assessment, allowing students to partake in practices and learning's from various case studies from the collection. Concluded by round table discussion on findings and observations.

Souvenir Koala Photo and free time to explore the sanctuary to complete assessment's from teaching faculty.

Overnight at Reef HQ Aquarium

Day 11: Magnetic Island & Bungalow Bay Koala Village.

8:45am Return transfers to Magnetic Island via SeaLink Ferry

Catch local bus to Bungalow Bay and arrive at 9:30am, Ranger Tony will collect group at the terminal.

Magnetic Island hosts a diverse array of eco systems, flora and fauna to start your learning experience about Terrestrial Landscapes found throughout Queensland. Magnetic Island is home to Australia's most northern population of wild Koala's, the most concentrated population of Northern Death Adders, plus a large array of interesting creatures such as the endangered bush stone curlew. Join Ranger Tony for a 1 hour presentation showcasing the biodiversity of Queensland's habitats tied in with his special personal collection of wildlife endemic to each region. This presentation will be conducted in the historic one room Horseshoe Bay School house that has been once again opened since 1972 for Bungalow Bay to use for Education purposes.

Progress through the Magnetic Island National Park into the low wetlands area of Horseshoe Bay before climbing into the dry sclerophyll forests bordering the granite boulder habitats. We will showcase some diverse habitats making home to over 75 species of reptiles, mammals and birds found in the dry tropics. Students can continue the Four Beach walking track over the hill to Radical, Florence and Arthur Bay. As your group will now be overnighing on the island we are in no rush. Students will be able to hire snorkel gear if they are interested before they depart to snorkel fringing reef at Florence and Arthur Bay.

Optional extra snorkel hire is \$15 per person.

Overnight Bungalow bay Koala Village.

Day 12: Rest and Relaxation Day - Recharge the Batteries.

Breakfast with the Koala's - Enjoy a gourmet breakfast of lamb loins encrusted with outback spices, reef fish with lemon myrtle, bacon + eggs, pancakes with rosella jam and Native Honeycomb. Be welcomed with a glass of champagne and guava and also experience koala's, crocodiles + snakes with our local rangers.

Afternoon at your leisure either on Magnetic Island or back on the mainland.
Overnight at Reef HQ Aquarium
Day 13: Charters Towers - Texas Longhorn Artificial Insemination Project.
Situated just 10 kilometres from the famous gold city of Charters Towers or 140 kilometres south west of Townsville, North Queensland, is Leahton Park. This property is home to Horseshoe B Longhorns - the largest herd of purebred Texas Longhorn cattle in Australia.
Leahton Park uses artificial insemination exclusively and below is a selection of the Bulls used in the breeding program at Leahton Park, both past and present. We use the best genetics available in Australia and work with other leading Texas Longhorn breeders in this country to import semen from some of the best AI sires in the USA.
Overnight at Reef HQ Aquarium
Day 14: Burdekin - Commercial Aquaculture.
Pacific Reef Fisheries is an Australian owned aquaculture company that was established in 1998. The company produces 900 tonnes of tiger prawns each year for a major Australian supermarket chain and also for the Sydney and Melbourne fish markets. Pacific Reef Fisheries has also recently worked with the Department of Primary Industries to produce Cobia or Black King Fish for the fresh fish market.
Throughout a visit to Pacific Reef Fisheries, learn about the extensive research and development that drives improved production efficiencies and environmental outcomes from hatchery to market. Operating adjacent to the Great Barrier Reef within the Australian aquaculture industry Pacific Reef Fisheries abides by the most stringent environmental requirements in the world see some of the practices adopted and new research being carried out to achieve environmental outcomes.
Aquaculture technical visit continues.
Farewell Dinner
Overnight at Reef HQ Aquarium.
Day 15: Depart Townsville.
Airport transfers can be organised by Reef HQ Aquarium.