Locations:

Marine and Natural Sciences Building = MNS

Lecture rooms: MNS 200, MNS 210, MNS 213

Labs: MNS 103, MNS 107, MNS 203

**Sunday, 26. May 2019**

12:00-13:30 Registration – Check-In

Bayside Apartments

14:00 Orientation

MNS 200 Directors

15:00 RWU Required Safety Lecture

MNS 200 Caitlin Conley

16:00 Ecology, Natural History, Physiology, Anatomy of Marine Invertebrates

MNS 210 Dr. Robert Maze – Marinetics, Inc.

AQUAVET® Associate Director

18:30 Ecology, Natural History, Physiology, Anatomy of Marine Invertebrates

MNS 210 (continued)

 Dr. Maze

19:30 **Welcome to AQUAVET Party**

Dorm Courtyard Area (weather permitting)

**Monday, 27. May 2019 – Memorial Day**

8:00 **Rocky Intertidal Invertebrate Collecting LOW TIDE 8:45**

leave from MSN 103 (dress appropriately – will be outside and in water)

10:00 Ecology, Natural History, Physiology, Anatomy of Marine Invertebrates

MNS 210 (continued)

 Dr. Maze

13:00 Ecology, Natural History, Physiology, Anatomy of Marine Invertebrates

MNS 210 (continued)

 Dr. Maze

15:00 **Invertebrates - WET LAB - (need dissection kit, lab coats)**

MNS 103 Dr. Maze

**18:00** **Invertebrates - WET LAB - (continued)**

MNS 103 Dr. Maze

 **NOTE: re-starting lab at 6pm – instead of 6:30pm**

**Tuesday, 28. May 2019**

8:00 History of Fishes: Taxonomy from an Evolutionary and Ecological

MNS 210 Perspective

Dr. Roy Yanong – U FL – Tropical Aquaculture Laboratory

10:00 Fish Anatomy - Structure and Function

MNS 210 Dr. Yanong

13:00 Fish Anatomy - Structure and Function (continued)

MNS 210 Dr. Yanong

14:00 **Fish Diagnostics and Techniques WET LAB**

MNS 103(need dissection kit, lab coats)

 Dr. Yanong

Dr. Rod Getchell – Cornell University

AQUAVET® Associate Director

15:00 **Fish Anatomy - Structure and Function WET LAB**

MNS 103(need dissection kit, lab coats)

 Drs. Yanong and Getchell

18:30 Anatomy, Diseases and Zoonotic Implications of Marine Invertebrates

MNS 210 Dr. Roxanna Smolowitz – Roger Williams University

**Wednesday, 29. May 2019**

8:00 Fish Anatomy - Structure and Function

MNS 210 Dr. Yanong

10:30 **Invertebrates - WET LAB - (need dissection kit, lab coats)**

MNS 103 Dr. Maze

13:00 **Invertebrates - WET LAB - (continued)**

MNS 103 Drs. Smolowitz and Maze

**18:00** **Invertebrates - WET LAB - (continued)**

MNS 103 Drs. Smolowitz and Maze

 **NOTE: re-starting lab at 6pm – instead of 6:30pm**

**Thursday, 30. May 2019**

8:00 Water Quality

MNS 210 Dr. Laurie Landeau – Marinetics, Inc.

AQUAVET® Associate Director

10:30 Fish Physiology

MNS 210 Dr. Lysa Posner – NC State University

13:00 Historical Aspects of the AQUAVET® Program

MNS 210 Dr. Donald Abt - AQUAVET® Founding Director

14:30 Tall Ships

MNS 210 Dr. Abt

15:00 Fish Physiology (continued)

MNS 210 Dr. Posner

18:30 Fish Physiology (continued)

MNS 210 Dr. Posner

**Friday, 31. May 2019**

8:00 Using Aquatic Animals in Research and the Role of IACUC

MNS 200 Dr. Neil Lipmann - Memorial Sloan Kettering Cancer Center

10:00 Life Cycles of Aquarium Raised Fish

MNS 210 Dr. Andy Rhyne – Roger Williams University

13:00 Aquatic Immunity

MNS 210 Dr. Erin Bromage – University of Massachusetts Dartmouth

16:00 Tides

MNS 210 Dr. Abt

18:30 Regulations in Aquaculture

MNS 210 Dr. Kathleen Hartmann – USDA APHIS Veterinary Services

**Saturday, 1. June 2019**

0:00 **Microbiology Lab Set Up** (lab coats and dissection kits)

MNS **203** Dr. Lester Khoo – Mississippi State University

 AQUAVET® Director Emeritus

9:00 **Microbiology – Specimen Necropsy** (lab coats and dissection kits)

MNS **203** Dr. Khoo

13:00 Selected Bacterial and Viral Pathogens of Fishes

MNS 210 Dr. Lester Khoo

15:00 off

**Sunday, 2. June 2019** – OFF

8:30 leave campus for **OPTIONAL Whale Watch – Barnstable, MA**

10:00 check in for Whale Watch

11:00 OPTIONAL Whale Watch $40 per person

 Barnstable, MA

18:00 **AQUAVET® Joint Class Picnic**

courtyard

**Monday, 3. June 2019**

8:00 **Selected Bacterial and Viral Pathogens of Fishes**

MNS **203** Micro Lab (lab coats and dissection kits)

 Dr. Khoo

10:00 **Water Quality Lab** (half of the class)

MNS 103 Dr. Landeau

10:00 Life Cycles of Aquarium Raised Fish – facilities visit (other half of class)

MNS 210 Dr. Andy Rhyne – Roger Williams University

13:00 **Water Quality Lab** (repeat)

MNS 103 Dr. Landeau

13:00 Life Cycles of Aquarium Raised Fish – facilities visit (repeat)

MNS 210 Dr. Rhyne

15:00 Normal Fish Histology

MNS 210 Dr. Sal Frasca – U FL Aquatic, Amphibian, and Reptile Pathology

 Program, College of Veterinary Medicine

18:30 **Normal Fish Histology** – Microscope Lab

MNS 103 Dr. Frasca

**Tuesday, 4. June 2019**

8:00 Pathology and Histopathology of Fish

MNS 210 Dr. Frasca

11:00 **Pathology and Histopathology of Fish –** Microscope Lab

MNS 103 Dr. Frasca

13:00 **Pathology and Histopathology of Fish –** Microscope Lab (cont)

MNS 103 Dr. Frasca

14:30 Harmful Algal Blooms

MNS 210 Dr. Chris Gobler – Stonybrook Southampton

18:30 Introduction to Fish Hematology

MNS 210/103 Jill Arnold – Zooquatic Lab

**Wednesday, 5. June 2019**

8:00 Disease Investigations and Case Reports for Coldwater Fishes

MNS 210 Dr. Lovy - NJ Div of Fish & Wildlife, Office of Fish & Wildlife

9:00 Environmental/Nutritional Disease of Coldwater Fishes

MNS 210 Dr. Lovy

10:00 Student Seminars

MNS 210

**1 Xanth El-Sayed –** Lionfish Invasion in the Caribbean; How It Started

and Current Status

**2 Amanda Vegter-** Life History, Current Status and Conservation Efforts

of *Carcharodon charcharias*

**3 Daniel Ruvolo –** Slingshot Feeding Mechanism of the Goblin Shark

**4 Vince Nicoletta –** Captive Marine Mammal Reproduction

13:00 Viral Diseases of Coldwater Fishes

MNS 210 Dr. Tom Loch – MSU-AAHL, Colleges of Agriculture & Natural

 Resources and Veterinary Medicine

15:00 Parasitic and Fungal Diseases of Coldwater Fishes

MNS 210 Dr. Lovy

18:30 Reptile Medicine

MNS 210 Dr. Mike Corcoran – Bulger Veterinary Hospital, North Andover, MA

20:30 AQUAVET® I T-shirt LOGO contest

MNS 210 Dr. Landeau

**Thursday, 6. June 2019**

8:00 Aquatic Birds

MNS 210 Dr. Cindy P. Driscoll - Maryland Department of Natural Resources

11:00 Diseases of Warmwater Aquaculture Fishes - Infectious Diseases

MNS 210 Dr. Sherman Jack – Mississippi State University, CVM

13:00 **Aquatic Birds Anatomy Lab – WEB LAB –** (dissection kits, lab coats)

MNS 103 Dr. Driscoll

15:00 Diseases of Warmwater Aquaculture Fishes - Infectious Diseases (con’t)

MNS 210 Dr. Jack

16:00 Diseases of Warmwater Aquaculture Fishes – Non-Infectious Diseases

MNS 210 Dr. Jack

18:30 Diseases of Warmwater Aquaculture Fishes – Non-Infectious Dz (con’t)

MNS 210 Dr. Jack

19:30 Culture and Health Concerns of Baitfish and Hybrid Striped Bass

MNS 210 Dr. Jack

**Friday, 7. June 2019**

8:00 Challenging Aquarium Cases

MNS 210 Dr. Donald W. Stremme – Cornell University

AQUAVET® Director

10:00 Corals

MNS 210 Dr. Ilze Berzins – One Water, One Health, LLC

13:00 Corals (continued)

MNS 210 Dr. Berzins

14:00 Penguins!

MNS 210 Dr. Stremme

15:00 Resource Assessment

MNS 210 Dr. Russell Brown – National Marine Fisheries Service

18:30 Aquaculture Systems

MNS 210 Dr. Rhyne

**Saturday, 8. June 2019**

8:00 Shrimp Industry

MNS 210 Dr. Bob Bullis - Florida Keys Community College

Dr. Arun Dhar – University of AZ, Aquatic Pathology Laboratory

13:00 Student Seminars

MNS 210 **5 Annie Clift –** Affects of Climate Change on Olive Ridley Nesting

Beaches in the Southern Nicoya Peninsula of Guanacaste, Costa

 Rica

**6 Matt Sullivan –** The Life Cycle and Reproductive Strategies of Mussel

Species

**7 Kristina Kelley –** Aquaponics: Implications for Future Growth

**8 Michelle Barnett –** Toxoplasmosis?Get Otter Here!

15:00 Oyster Culture, Environment, Disease and Nutrition

MNS 210 Dr. Maze

17:00 OFF

**Sunday, 9. June 2019**

OPEN

**Monday, 10. June 2019**

8:00 Student Seminars

MNS 210 **9 Tommy Burdette –** Sea Anemone Reproduction

**10 Stephanie Bellinghausen –** General Principles and Challenges in

Pinniped Anaesthesia

**11 Lyndsy Gazda –** Amphibians: The Next Big Extinction

**12 Nicole Copeland –** Case Study of the First CSF Tap Performed on a

Live Bottlenose Dolphin

10:00 Drugs used in Aquaculture - Regulations, labels, FDA, CVM and

MNS 210 Medicated Feeds

 Dr. Emily Cornwell – Muddy Branch Veterinary Center

13:00 Medical Aspects of HABs – and Aquatic Toxicology

MNS 210 Dr. Lisa Murphy – University of Pennsylvania

14:00 (Sea)food Safety – Emphasis on Toxins

MNS 210 Dr. Murphy

15:00 Other Aspects of Aquatic Toxicology and Selected Cases

MNS 210 Dr. Murphy

16:00 Seafood Safety – The Risks of Eating Raw Seafood

MNS 210 Dr. Maze

18:30 Economic Considerations in the Development of Aquaculture Operations

MNS 210 Dr. Landeau

**Tuesday, 11. June 2019**

8:00 Student Seminars

MNS 210 **13 Danielle Scott –** The Effects of Macro-plastic Pollution on Marine

Animals and What You Can Do to Reduce Your Impact

**14 Tara Needham –** White Spot Syndrome Virus (WSSV) with Special

Reference to the Queensland, Australian 2016/17 Outbreak

circa

10:00 leave RWU for Boston – New England Aquarium

12:00 estimated arrival time – lunch Faneuil Hall

**13:00 New England Aquarium – Behind the Scenes Tours**

 **Dr. Tuxbury and staff**

15:00 open time to visit NEAQ on own

 (aquarium closes at 5pm)

17:15 Amphibians!

NE AQ Dr. Kathy Tuxbury

 Dinner during presentation

Circa drive back to RWU

18:30

**Wednesday, 12. June 2019**

8:00 Biology, Medicine and Surgery of Turtles Including Sea Turtles

MNS 210 Dr. Charles Innis – New England Aquarium

13:00 **Turtle Necropsy Lab (lab coats, dissection kit)**

MNS 103 Drs. Innis

16:00 Fish Nutrition

MNS 210 Dr. Dale Leavitt – Roger Williams University

18:30 Fish Nutrition (continued)

MNS 210 Dr. Leavitt

**Thursday, 13. June 2019**

**Today is overnight trip to Riverhead, NY. Take what you will need with you.**

6:00 Leave RWU for Riverhead, Long Island, NY

 (breakfast on ferry)

7:30 Arrive New London Ferry Terminal

 they require arrival 30 minutes ahead of departure

8:00 Ferry to Orient Point, NY

9:20 or so arrive Orient Point – drive to Riverhead, NY

**10:30** Atlantis Marine World Aquarium and

 Riverhead Foundation for Marine Research and Preservation

10:30 RFMRP - Clinical Techniques for Marine Mammals and Aquatic Animals - WET LAB – Bring Old Clothes or Clothing Covers

 Dr. Robert Pisciotta

 Dr. Richard Hanusch

 Maggie Seiler

 Candyce Paparo

 Maxine Montello

13:00 RFMRP - Clinical Techniques for Marine Mammals and Aquatic Animals – (continued)

18:30 Coral Biology, Husbandry and Propagation

 Joe Yaiullo – Atlantis Marine World

20:30 Hyatt Hotel - overnight

**Friday, 14. June 2019**

6:30 Hyatt Hotel breakfast

7:30 pack, check out and load cars

7:45 Leave Riverhead for ferry

8:30 arrive at Orient Point, NY

9:00 Ferry leaves for New London, CT

10:20 arrive New London

10:30 arrive at Mystic Aquarium

**10:30 Mystic Aquarium Tour**

**Dr. Allison Tuttle et al – Mystic Aquarium and**

**Institute for Exploration**

16:15 Leave Mystic for RWU

17:45 arrive on campus

**Saturday, 15. June 2019**

8:00 What is Unique about Eye Structure and Sight: From A (Avian)

MNS 210 to Z (Zalophus or Zebrafish)

 Dr. Carmen Colitz - Aquatic Animal Eye Care, LLC

11:00 Student Seminars

MNS 210 **15 Melissa Wyzan –** Elasmobranch Anaesthesia

**16 Marley Chou –** Acoustic Variation in Orcas

13:00 Student Seminars

MNS 210 **17 Alec Colosi –** Diving and Foraging Energetics of Sea Otters

**18 Katharine Hausmann –** The Succession of Coral Recruitment to Coral

Reefs

**19 Grace White –** Neoplasia in California Sea Lions

**20 Jessica Sprando –** Marine Mammal Zoonoses

**21 Kathryn Ziegner –** Sealpox Virus: Implications for Wildlife

Management

**22 Alexis DeMong –** Resident and Transient Orcas of the Pacific

Northwest

**Sunday, 16. June 2019**

OPEN

**Monday, 17. June 2019**

8:00 Marine Mammals

MNS 210 Dr. Allison Tuttle et al – Mystic Aquarium

 Dr. Inga Sidor – University of New Hampshire

 Dr. Paul Calle – Zool. Health Program, Wildlife Conservtn. Society

Dr. Brent Whitaker – Zooquatic Lab

Dr. Cara Field – The Marine Mammal Center

8:00 Marine Mammals – Taxonomy, Anatomy, Physiology, Reproduction

MNS 210 Dr. Field

9:45 Marine Mammal Diseases I (Bacterial, Viral)

MNS 210 Dr. Tuttle

11:00 Marine Mammal Diseases II (Fungal, Parasitic, Toxins, Misc.)

MNS 210 Dr. Tuttle

13:00 Important Marine Mammal Legislation, Regulatory Agencies, and Member

MNS 210 Organizations

Dr. Tuttle

13:45 Marine Mammal Water Quality/Life Support/Environmental Considerations

MNS 210 Dr. Field

15:00 Marine Mammals – Clinical Cases

MNS 210 Dr. Tuttle

16:00 Student Seminars

MNS 210 23 **Sungbin Lee –** Finless Porpoise: Past, Present and Future

24 **Lindsay Francis –** The Giant Pacific Octopus – Captive Husbandry and

 Welfare

18:30 Large Display Aquaria

MNS 210 Dr. Whitaker

20:15 Ethics of Keeping Marine Mammals Under Human Care (discussion)

MNS 210 Dr. Whitaker

**Tuesday, 18. June 2019**

8:00 Marine Mammals – Husbandry and Aquarium/Zoo Management

MNS 210 Dr. Calle

9:30 Marine Mammal Clinical Techniques

MNS 210 Dr. Calle

10:45 Marine Mammal Special Topics from the Marine Mammal Center

MNS 210 Dr. Field

13:00 Marine Mammal Stranding Cases

MNS 210 Dr. Whitaker

14:15 Marine Mammal Clinical Cases

MNS 210 Dr. Calle

15:45 Marine Mammal Stranding Cases

MNS 210 Dr. Sidor

18:30 Marine Mammals – Pathology, Principals of Necropsy,

MNS 210 Forensics – “How To”

Dr. Sidor

**Wednesday, 19. June 2019**

6:00 lv RWU for Woods Hole

7:30 Required OSHA training to be in the necropsy lab

Carriage House Misty Niemeyer – International Fund for Animal Welfare (IFAW) at

 WHOI

Breakfast during this training

8:00 **Marine Mammal Necropsy Lab WET LAB**

WHOI **(need dissection kit – protective clothing will be provided)**

 **Consider bring change of clothes for after this lab**

 Drs. Sidor, Field, Calle

Dr. Melissa Joblon – New England Aquarium

12:30 Students Present Results of Necropsies for the Group

Carriage House Dr. Sidor leading discussion

13:00 lunch

Carriage House

13:30 Stranding & What We Can Learn from Strandings, Including Large Whale

Carriage House Strandings and Mass Strandings

Dr. Sarah Sharp – International Fund for Animal Welfare (IFAW) at

 WHOI

16:00 leave MBL by this time or earlier

16:15 arrive at MBL and park

16:30 meet at MRC entrance

**16:30 Tour of MBL and MRC Facilities**

 **Dr. Lisa Abbo, MBL Veterinarian**

17:30 approx Group Photo and time to explore town

18:30 Dinner at Captain Kidd

20:30 approx depart for RWU

22:00 approx arrive RWU

**Thursday, 20. June 2019**

8:00 Overview of Pet Fish Medicine Including LSS and Water Quality

MNS 210 Dr. Jessie Sanders – Aquatic Veterinary Services

10:00 Pet Fish Medicine – Common Diagnostic Techniques

MNS 210 Dr. Sanders

11:00 Aquarium World Diagnostics and Selected Aquarium Cases

MNS 210 Dr. Shane Boylan – South Carolina Aquarium

13:00 Treatments for Fish Diseases in Warmwater Pet Fish: Goiter, Gas

MNS 210 Saturation, Trauma, Infectious Diseases, etc.

 Dr. Boylan

15:00 Selection of Pet Fish Cases

MNS 210 Dr. Geoffrey Groocock – Transit Animal Hospital

16:00 Selection of Pet Fish Cases (continued)

MNS 210 Dr. Sanders

18:30 Fish Anaesthesia and Surgical Techniques

MNS 210 Dr. Groocock

**Friday, 21. June 2019**

8:00 **Fish Surgery Lab - HALF of CLASS**

**MNS 103** no special equipment needed by students

 wear scrubs or tshirt

Drs. Groocock, Boylan and Sanders

8:00 **RWU Shellfish Facility Visit** (half of the class)

Meet MNS 103 Dr. Dale Leavitt – Roger Williams University

 Robbie Hudson - Roger Williams University

10:00 Both halves switch

13:00 Paths to Success in Aquatics

MNS 210 Dr. Ari Fustukjian – The Florida Aquarium

14:00 The Ornamental Fish Industry

MNS 210 Dr. Nick Saint-Erne – Certified Aquatic Veterinarian

15:00 Common Koi Problems

MNS 210 Dr. Saint-Erne

18:30 **AQUAVET®I Clambake**

**Saturday, 22. June 2019**

By 10:00 check out – back to reality