



EDGEWISE  
ENVIRONMENTAL

# **Passive Acoustic Monitoring (PAM) Operator**

## **Course Syllabus**

## **COURSE SYLLABUS: PASSIVE ACOUSTIC MONITORING OPERATOR**

### **INSTRUCTOR:** TBD

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### **COURSE DESCRIPTION:**

The course shall focus on passive acoustic mitigation processes of marine anthropogenic activities that may impact marine mammals. Offshore and coastal activities covered include, but are not limited to seismic exploration (2D, 3D, VSP, etc.), renewable energy, dredging, and pile driving. These activities and associated mitigative actions shall be discussed in relation to the “Statement of Canadian Practice with Respect to the Mitigation of Sound in the Marine Environment” and “The Species at Risk Act”. This course includes a field component.

### **COURSE OBJECTIVES:**

By the end of the course trainees should be able to:

- ✔ Identify marine mammals according to their acoustic signature
- ✔ Understand the advantages/disadvantages of passive acoustic monitoring as a mitigation tool
- ✔ Describe potential acoustic sensitivities of marine mammals
- ✔ Understand and interpret the “Statement of Canadian Practice with Respect to the Mitigation of Sound in the Marine Environment”
- ✔ Understand and interpret the “Species at Risk Act”
- ✔ Fill out various recording pro forma and create daily, weekly and final reports
- ✔ Understand various marine anthropogenic activities in which PAM Operators would be required and have the ability to communicate this rationale
- ✔ Understand the basic components of a PAM system
- ✔ Troubleshoot basic hardware issues of an average PAM system
- ✔ Use PAMGUARD and understand how to troubleshoot various problems
- ✔ Understand how to use MS Access and SQ Lite
- ✔ The ability to set up, format and run a PAM system

### **LEARNING OUTCOMES:**

The course will include the following learning outcomes:

- ✦ A review of the “Statement of Canadian Practice with Respect to the Mitigation of Sound in the Marine Environment”
- ✦ A review of the “Species at Risk Act”
- ✦ Identification of marine mammal acoustic signatures (with specific focus on those species found within Canadian waters)
- ✦ A basic introduction to marine mammal acoustics and underwater sound
- ✦ Instruction on various PAM hardware and software
- ✦ Instruction on completing various recording pro forma
- ✦ Essential information to be included within the PAM report
- ✦ Offshore decorum, equipment requirements

### **PRE-REQUISITES:**

There are no formal pre-requisites for this course. It is recommended personnel have a general knowledge of marine mammal acoustics and be very proficient in using a computer.

### **COURSE MATERIAL:**

All course material will be provided. This includes all presentation material and various supplemental documents.

### **REQUIRED COURSE READING:**

**BEFORE ATTENDING** it is required that all trainees have reviewed:

- ✦ The “Statement of Canadian Practice with Respect to the Mitigation of Sound in the Marine Environment”
- ✦ The “Species at Risk Act”

It is also highly recommended that trainees have familiarized themselves with general species knowledge.

### **REQUIRED ITEMS:**

It is expected that all trainees will have access to the following items during the online theory portion of the course:

- ✔ A laptop with a stable internet connection and the following downloaded software:
  - MS Access: if you do not already have MS Access please download a free trial
  - MS Excel
  - MS Word

It is expected all trainees will arrive to the practical portion of the course with the following items:

- ✔ A laptop with the following downloaded software:
  - PAMGUARD: <https://www.pamguard.org/>
  - SQ Lite: <https://www.sqlite.org/index.html>
- ✔ A marine mammal identification guide. (See pg. 5 for recommendations)
- ✔ Headphones with an auxiliary jack
- ✔ Clothing suitable for inclement weather (this will be required for the field portion of the course)  
Suggested items include: Light layers of cotton, wool, or breathable material; rain pants and jacket, hat, gloves, sunglasses, sunscreen, and waterproof footwear (high around the ankle).
- ✔ A suitable (water resistant) bag to store items
- ✔ Wrist watch
- ✔ Clipboard and writing utensils

### **Schedule:**

The theory portion of the course will be conducted online. Links to course material will be provided by your instructor. A weekly meeting will be organized for review and quiz purposes. Trainees will be expected to complete 1-2 modules per week. Quizzes shall be conducted throughout the course, at your own pace as well as with the instructor during your weekly meetings. A date for the practical session (2 days) shall be discussed at the end of the course. A schedule shall be provided once registered for the course.

### **Grading Scheme and Evaluation:**

Module Exams:	40%
Final Exam:	40%
Practical (at sea):	20%

Trainees require a minimum of 60% to pass the course.

### **Certification:**

The certification scheme is as follows:

0% - 60%:	Fail. Trainee will require remedial training.
60% - 80%:	Certified
80% +:	Certified with Merit

### **Identification Guide Recommendations**

- 1) Smithsonian Handbooks Whales Dolphins and Porpoises  
Author: Mark Carwardine  
Publisher: DK ADULT (2002)  
Amazon.ca: <https://www.amazon.ca/Smithsonian-Handbooks-Whales-Dolphins-Porpoises/dp/0789489902>  
Chapters: <https://www.chapters.indigo.ca/en-ca/books/handbooks-whales-dolphins-the-clearerest/9780789489906-item.html>
- 2) National Audubon Society Guide to Marine Mammals of the World  
Authors: National Audubon Society, Pieter Folkens (Illustrator)  
Publisher: Knopf (April 2002)  
Amazon.ca: <https://www.amazon.ca/National-Audubon-Society-Marine-Mammals/dp/0375411410>
- 3) Whales, Dolphins, and Other Marine Mammals of the World  
Authors: Hadoram Shirihai (Author), Brett Jarrett (Illustrator)  
Publisher: Princeton University Press (Oct. 2006)  
Amazon.ca: <https://www.amazon.ca/Whales-Dolphins-Other-Marine-Mammals/dp/0691127573>