

DRAFT

Training School Programme, March 2023

[Subject to change]

| Session | Time | Session Title and Content | Lead Tutor |
|--------------|-------------|---|------------|
| Day 1 | | Basic Principles | |
| | 8.50-9.15 | Registration | |
| 1 | 09.15-09.45 | Introduction to course: The Three Rs, legal and ethical aspects of Experimental Design. | MHS |
| 2 | 09.45-10.15 | Quiz 1 | DF |
| 3 | 10.15-11.00 | Principles of experimental design: types of experiment (pilot, exploratory, confirmatory), objectives, controls, experimental units, replication, randomization, blinding. | DF |
| | 11.00-11.30 | BREAK | |
| 4 | 11.30-12.15 | Common failings: unclear objectives, bias, lack of power, failure to randomize/blind, pseudoreplication. Costs of poor design. | RP |
| 5 | 12.15-13.15 | Group Exercise 1: Controls, experimental units. | DF |
| | 13.15-14.45 | LUNCH | |
| 6 | 14.45-15.30 | Basic statistical inference: null and alternative hypotheses, SD vs. SE, outliers, type I & type II errors, variables affecting significance, summary statistics. | DL |
| 7 | 15.30-16.15 | Sources of variability: in animal studies and how they may be controlled. Need for better design. | DF |
| | 16.15-16.45 | BREAK | |
| 8 | 16.45-17.45 | Importance of controlling variability: simulating experiments and the importance of controlling variability. Randomisation, sampling, Type 1 and Type 2 errors. | DL |
| | 19.00-21.00 | DINNER | |
| Day 2 | | Experimental Designs and Statistical Analysis | |
| 9 | 09.00-09.45 | The analysis of variance: interactions, post-hoc tests, assumptions, data transformations. | MS |
| 10 | 09.45-10.30 | Group Exercise 2: Finding basic faults. | DF |
| 11 | 10.30-11.15 | Different designs: completely randomised, randomised block and latin square designs. Power calculations, resource equation. | RP |
| | 11.15-11.45 | BREAK | |
| * | 11.45-12.30 | Guest Session: Statistical power and design of aquaculture experiments: Getting the most certainty with the least fish. Delivered live via online video connection | GD |

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| 12 | 12.30-13.15 | Non-continuous data: qualitative data, contingency tables, non-parametric tests. | RP |
| | 13.15-14.15 | LUNCH | |
| 13 | 14.15-15.00 | Factorial designs | MS |
| 14 | 15.00-15.45 | Group Exercise 3: Choosing the right design & over-night exercise. | DF |
| | 15.45-16.15 | BREAK | |
| 15 | 16.15-17.00 | Experiments to test relationship: correlation, regression. | MS |
| 16 | 17.00-18.00 | Tools and software: power analysis, EDA and the pros and cons of software. | DL |
| | 19.00-21.00 | DINNER | |
| Day 3 | | | |
| Day 3 | | Applied Experimental Design and Important Design Messages | |
| 17 | 09.00-09.45 | Discussion of overnight exercise. Presentation and planning: presenting results and planning an experimental programme. | DF |
| 18 | 09.45-10.30 | Quiz 2 and discussion. | DF |
| | 10.30-11.00 | BREAK | |
| 19 | 11.00-11.45 | Ethics by design: Writing an experimental protocol, ethical review & 3Rs PREPARE Guidelines | MHS AS |
| 20 | 11.45-12.30 | Searching and resources: searching for information on Rs and 3Rs resources | MHS |
| | 12.30-14.00 | LUNCH | |
| 21 | 14.00-14.15 | Answers to Quiz 2 & take-home messages. | DF |
| 22 | 14.15-15.00 | Ask the experts: opportunity for participants to discuss any unresolved design problems with the tutors | DF/DL/RP/ MS/AS |
| 23 | 15.05-16.05 | FELASA Examination | |

Tutors: Dr Michelle Hudson-Shore [MHS], Dr Derek Fry [DF], Prof. Richard Preziosi [RP], Dr David Lovell [DL], Prof. Kate Millar [KM], Dr Martin Sullivan [MS] and Prof. Adrian Smith [AS]
 Guest Speaker: Dr Gareth Gifford [GD]