

# Preregistration

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## Credit statement and licence

Possible roles using the CRediT contribution system:

- **Conceptualization:** Ideas; formulation or evolution of overarching research goals and aims
- **Methodology:** Development or design of methodology; creation of models
- **Software :** Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components
- **Validation:** Verification, whether as a part of the activity or separate, of the overall replication/ reproducibility of results/experiments and other research outputs
- **Formal analysis:** Application of statistical, mathematical, computational, or other formal techniques to analyze or synthesize study data
- **Investigation:** Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection
- **Resources:** Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools
- **Data Curation:** Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later reuse
- **Writing - Original Draft:** Preparation, creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation)
- **Writing - Review & Editing:** Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre-or postpublication stages
- **Visualization:** Preparation, creation and/or presentation of the published work, specifically visualization/ data presentation

- **Supervision:** Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team
  - **Project administration:** Management and coordination responsibility for the research activity planning and execution
  - **Funding acquisition:** Acquisition of the financial support for the project leading to this publication
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## Prerequisites

### ! Prerequisites

Before completing this submodule, please carefully read about the necessary prerequisites.

Prerequisite	Description	Link/Where to find it
Topic Name	Basic intro to X	Module + Submodule
Software Name	Configuring the environment	<a href="#">Download Link</a>

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## Questions from previous submodule

- **Aim:** This first slide is dedicated to clarifying questions from the previous submodule and/or to discuss assignments.
  - Additional slides may need to be added depending on the nature of the homework assignments.
  - Critical for the learning process to ensure that students are on the same page and have been able to achieve the learning goals of the previous workshop.
  - Not applicable if this set of slides corresponds to the first submodule of a new module.
-

### Before we start: Survey time!

- **Aim:** The pre-submodule survey serves to examine students' prior knowledge about the submodule's topic.
  - Use free survey software such as or other survey software (particify, formR) to establish the following questions (shown on separate slides):
- 

**What is your level of familiarity with [Topic] (e.g., basic concepts, terminology, or tools)?**

- a. I have never heard of it before.
  - b. I have heard of it but have never worked with it.
  - c. I have basic understanding and experience with it.
  - d. I am very familiar and have worked with it extensively.
- 

**Which of the following concepts or skills do you feel most confident about in relation to [Topic]? (Select all that apply)**

- a. Concept 1
  - b. Concept 2
  - c. Concept 3
  - d. Concept 4
  - e. I am not sure about any of these concepts.
- 

**On a scale of 1 to 5, how comfortable are you with using [specific tool/technology] related to [Topic]? (1 = Not comfortable at all, 5 = Very comfortable)**

- a. 1
  - b. 2
  - c. 3
  - d. 4
  - e. 5
-

## Discussion of survey results

- **Aim**”: Briefly examine the answers given to each question interactively with the group.
- Use visuals from the survey to highlight specific answers.

Make it clear to the group that there will be a similar post-submodule survey to examine understanding and learning progress.

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## Where are we at?

- **Aim**: Place the topic of the current submodule within a broader context.
  - Remind students what you are working towards and what the bigger picture is.
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## Learning goals

- **Aim**: Formulate specific, action-oriented goals learning goals which are measurable and observable in line with Bloom’s taxonomy (Anderson et al., 2001; Bloom et al., 1956)
  - Place an emphasis on the **verbs** of the learning goals and choose verbs that align with the skills you want to develop or assess.
  - Examples:
    - Students will **describe** the process of photosynthesis or
    - Students will **construct** a diagram illustrating the process of photosynthesis
- 

## Key terms and definitions

- **Aim**: Introduce key terms and definitions that students will come across throughout the session.
- **Key Term 1**: Definition
- **Key Term 2**: Definition
- **Key Term 3**: Definition

Base yourself on conceptual change theory and examine existing concepts in relation to some key terms. Re-examine formation of new concepts at the end of the lesson.

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### Introduction of submodule topic

- **Aim:** Core theoretical introduction of submodule topic.
- Pair theoretical aspects with practical exercises and group discussions according to the Think-Pair-Share style and according to Cognitive Load Theory (Sweller, 1980).
- Use multiple slides for this part.

For a 90-minute lesson, the instructor should try to “lecture” for only 20 minutes, students should work in groups/pairs/on their own for at least 55 minutes of the lesson (+ a 15 minute break).

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### Submodule content slide

- **Aim:** Present relevant content
- Highlight particularly important aspects with Quarto call-out boxes, for example:

! Important with Title

This is an example of a callout box to highlight particularly important information.

💡 Tip with Title

This is an example of a callout box to give important tips.

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### Pre-break survey

- **Aim:** This pre-break survey serves to examine students’ current understanding of key concepts of the submodule
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**Use free survey software such as or other survey software (participify, formR) to establish the following questions (shown on separate slides):**

**Which species is the largest type of penguin?**

- a. Chinstrap Penguin
  - b. Emperor Penguin
  - c. Adélie Penguin
  - d. King Penguin
- 

**What is the key biological feature that helps penguins swim efficiently?**

- a. Hollow bones for buoyancy
  - b. Webbed feet for paddling
  - c. Waterproof feathers and flipper-like wings
  - d. Gills to breathe underwater
- 

**Break! 15 minutes**

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**Post-break survey discussion**

- **Aim:** To clarify concepts and aspects that are not yet understood
  - Highlight specific answers given during the survey
-

## Practical exercises on topic

- **Aim:** Design practical exercises for students to apply the new skills in practise.
- Depending on the topic, the exercises should be in accordance with the learning objective(s).

For students who advance faster: Prepare extra exercises.


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## Relevance and implications

- **Aim:** To work out the relevance of the topic to your students.
  - In an interactive setting, discuss how the new skills could be applied in practise with specific examples.
  - Examine downfalls and practical obstacles.
- 

## Take-home message

**Aim:** End lesson on clear take-home message that are interactively compiled by students.

 Tip with Title

Add one practical tips or take-home message.

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## Assignment

- **Aim:** Explain the homework assignment and the rationale behind the homework.
  - Examine whether/how it will be assessed
  - Mention scoring rubrics, if applicable
  - Design a peer-review system for assignments to place students in role of reviewer and author
-

**To conclude: Survey time!**

- **Aim:** This post-submodule survey serves to examine students' current knowledge about the submodule's topic.
  - Use free survey software such as or other survey software (participify, formR) to establish the following questions (shown on separate slides):
- 

**What is your level of familiarity with [Topic] (e.g., basic concepts, terminology, or tools)?**

- a. I have never heard of it before.
  - b. I have heard of it but have never worked with it.
  - c. I have basic understanding and experience with it.
  - d. I am very familiar and have worked with it extensively.
- 

**Which of the following concepts or skills do you feel most confident about in relation to [Topic]? (Select all that apply)**

- a. Concept 1
  - b. Concept 2
  - c. Concept 3
  - d. Concept 4
  - e. I am not sure about any of these concepts.
- 

**On a scale of 1 to 5, how comfortable are you with using [specific tool/technology] related to [Topic]? (1 = Not comfortable at all, 5 = Very comfortable)**

- a. 1
  - b. 2
  - c. 3
  - d. 4
  - e. 5
-



## Discussion of survey results

- **Aim:** Briefly examine the answers given to each question interactively with the group.
  - Compare and highlight specific differences in answers between pre- and post-survey answers
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## References

- Provide literature you refer to throughout this lesson.
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## Thanks!

See you next class :)

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## Pedagogical add-on tools for instructors

- This section is dedicated to ideas on how to incorporate pedagogical tools into teaching for this specific submodule topic. This could mean:
    - Information about the scientific evidence on the theory of the pedagogical add-on tool and the evidence for its efficacy.
    - Discussion/reflection on how tools can be incorporated into the teaching for this particular content.
    - Extra exercises for faster students.
- 

## Additional literature for instructors

- References for content
  - References for pedagogical add-on tools
  - Other resources (videos etc.)
-

## Formatting elements for instructors

- **Aim:** This section contains templates for different formatting elements, which can be modified and adapted for the instructor's individual purposes.
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### Text with example links

- [Quarto Documentation](#)
  - [Reveal.js Documentation](#)
  - [Markdown Guide](#)
  - [GitHub](#)
- 

### Basic text formatting

- **Bold:** `**bold**` → **bold**
  - *Italic:* `*italic*` → *italic*
  - ~~Strikethrough:~~ `~~text~~` → ~~text~~
  - `Inline code: `code`` → `code`
  - `Blockquote: > Quote` →  
"This is a quote"
- 

### Figure with caption

- Centered image and caption below in italics

This is a Penguin.

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### Figure with bullet points

- First bullet point
  - Second bullet point
  - Third bullet point
- 

### Side-by-side figures

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### Stacked figures with text

- First bullet point
  - Second bullet point
  - Third bullet point
- 

### Two-column text slide

#### Column 1

Lorem ipsum dolor sit amet, consectetur adipiscing elit.  
Vivamus lacinia odio vitae vestibulum vestibulum.  
Cras venenatis euismod malesuada.

#### Column 2

Sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.  
Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris.

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## Three-column text slide

### Column 1

Lorem ipsum dolor sit amet, consectetur adipiscing elit.  
Vivamus lacinia odio vitae vestibulum vestibulum.

### Column 2

Sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.  
Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris.

### Column 3

Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla  
pariatur.

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## Simple table

Column 1	Column 2	Column 3
Row 1 Cell	Row 1 Cell	Row 1 Cell
Row 2 Cell	Row 2 Cell	Row 2 Cell
Row 3 Cell	Row 3 Cell	Row 3 Cell
Row 4 Cell	Row 4 Cell	Row 4 Cell

---

## Complex table

Column 1	Column 2	Column 3
Row 1 Cell	Row 1 Cell	Row 1 Cell
Row 2 Cell	Row 2 Cell	Row 2 Cell
Row 3 Cell	Row 3 Cell	Row 3 Cell
Row 4 Cell	Row 4 Cell	Row 4 Cell

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## Task list

- ☒ Done
- ☐ To do

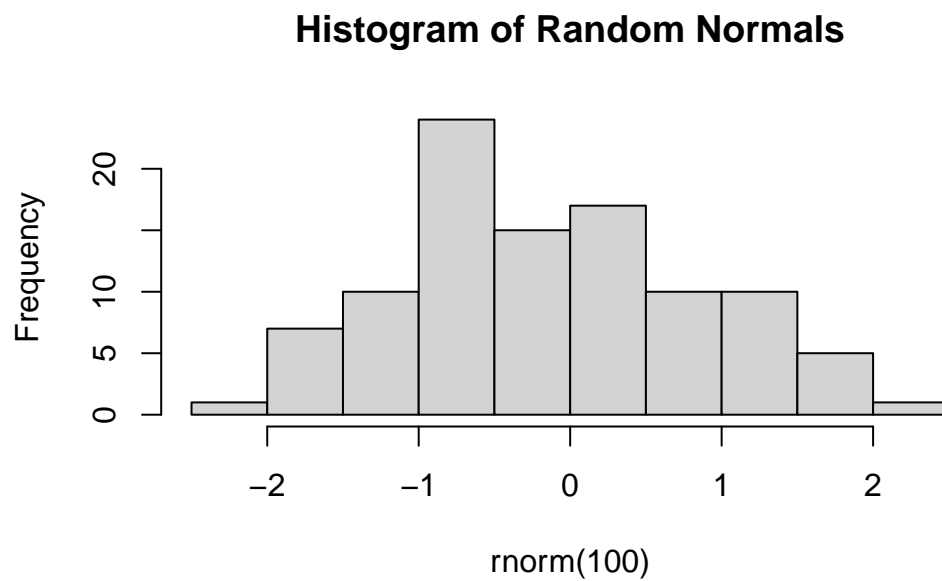
## Embedding videos

## Code blocks

```
# A basic R code chunk  
x <- 1:10  
mean(x)
```

```
[1] 5.5
```

```
# A simple plot  
hist(rnorm(100), main = "Histogram of Random Normals")
```



## Attribution and license details

- This slide should contain information about the license and attribution details of this current set of slides.
- The default for the created materials is [CC-BY-SA 4.0](#)
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  - allows for both **commercial and non-commercial** use of the licensed material
- Components of attributions:
  - Title
  - Author
  - Source
  - License

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## Example attribution (for previous slide)

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