Science Course

Course format (preliminary)

Modules   Lessons   Chapters

Methods in Science: scientific reasoning ⟶ **Introduction**
                                                              Reflecting mirrors
          Modelling and data fitting   **Gigaro Reproduction**
          Measures and uncertainties   **The mole concept**
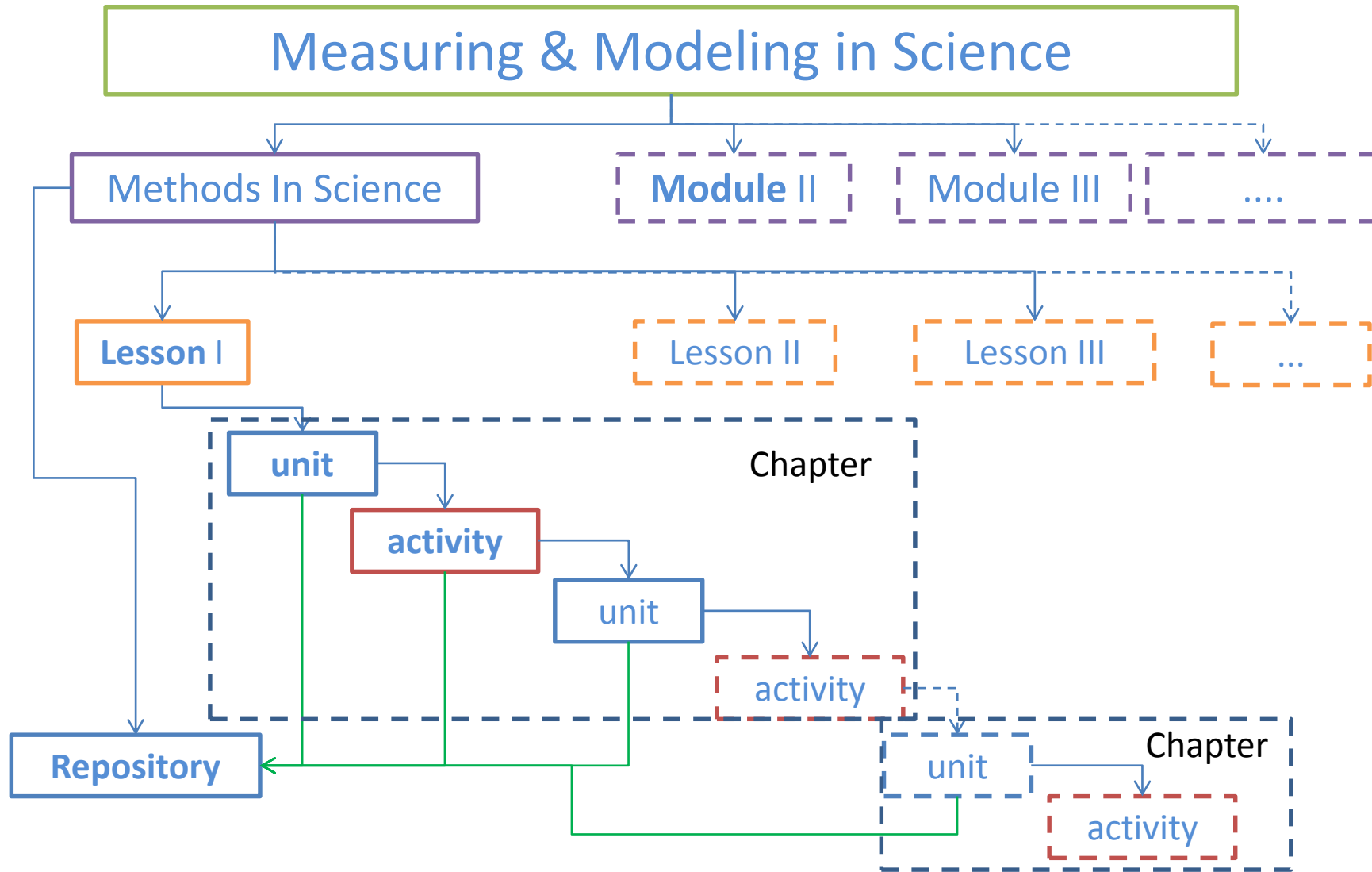
Optics through experiments   Refraction, Imaging, lenses
          Diffraction
          Interference

Seismo box   Water in sands
          Earthquake

Energy in Science   Mechanics
          Batteries
          Food
          Photosynthesis
          Photovoltaic cells

Course Description

Objectives

Quantitative characterization of everyday life phenomena

realize experimental activities related to daylife materials and instrumentations

scientifically approach to understanding daylife phenomena

Index of modules

Module Title	Topics	Contents
Methods in Science		o Deductive scientific rea o Measuring and uncertai o Modelling and data fitting
Optics (Traveling labs)		o Reflection law o Refraction law o Imaging and lenses o Diffraction o Interference

Seismo box		o Water in sands:
		  ▪ Capillarity and adh
		o Earthquake:
		  ▪ Resonances
		  ▪ Energy storage and

Energy in Science		o Mechanics o Battery o Food o Photosynthesis o Photovoltaic cell

Authors and contacts

Summary

Rights

Methods In Science

Description

The *scientific method* is the way to understand the physical origin of a phenomenon. Understanding is different from *believe* or simply *known*, Understanding means we know about the causes of a phenomenon, we can make previsions and estimate the risk of failure. In this module the Scientific method is presented as a deductive process proceeding by means of observation, hypothesis and verification in a continuously cycle with which science continually tests its laws, revises a theory, reviews his results.

Objectives

- *Making hypothesis* as the creative issue of the Scientific Method
- Use Measurement Uncertainty to distinguish experimental values, verify/falsify hypothesis
- Data modeling and physical laws: fitting and regression

Prerequisites

- Usage of electronic spreadsheets (Excel, Calc)

Summary

Authors	Carlo Meneghini (carlo.meneghini@uniroma3.it)
	Monica Bionducci (m.bionducci@gmail.com)
Topics	Methods
Description	The scientific method at work through Observation, hypothesis and verification
Publisher	SMART project
Contributors	
Type	Experimental (daylife)
Language	English
Coverage	(primary) secondary school science teachers
Rights	

Lesson Format

- Introduction: Believe, Known Understanding
- A look into a Mirror
- A look into the mirrors
- Repository