

An Introduction to Categorical Computing with Catlab

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Welcome

- This course will provide an introduction to core functionality for Catlab
- We will make reference to some other projects in AlgebraicJulia that build atop Catlab
- Our coverage will make use of scripts available here:
<https://github.com/UofS-CEPHIL/CatCompCMA2025>
- AlgebraicJulia Installation document:
<https://github.com/UofS-CEPHIL/CatCompCMA2025/blob/main/reference/installation.pdf>

Topics Covered

- FinSet & FinFunctions, identity & compositions of them
- FinRel, relations, identity & compositions of them;
- Definition of & presentation of a category from generators & relations; working with the category
- Defining schemas
- Defining instances of C-Sets with `@acset` and `@acset_colim`
- Category of elements visualization
- Homomorphisms between C-Sets, and visualization of graph homomorphisms as examples
- Computing with universal constructions (Product, Coproduct, Pushout, pullback, Equalizer, coequalizer)
- Attributes & ACSets
- As time allows: Modular structures with structured cospans, Rewriting (no attributes)

Protocol

- Questions are welcome throughout the mini-course
- Please feel free to just ask a short clarifying point
- If you'd like to ask a more substantive question, raising hands your hand is recommended, so that the instructor can finish up any loose ends prior to answering the questions
- Absent any participant concerns, the coverage will be recorded