

# RED PhD: HANK Models

Module IV  
2027 Syllabus

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## Course Description

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This PhD course introduces students to the analysis of monetary and fiscal policy in the presence of household heterogeneity. We explore the empirical and theoretical motivations for moving beyond representative agent models, study both quantitative heterogeneous agents New Keynesian (HANK) models and their tractable counterparts (THANK), and critically examine recent challenges to the heterogeneity-amplification narrative.

The aim is to provide students with the conceptual tools, modeling frameworks, and computational methods needed to decide *when* heterogeneity matters for monetary and fiscal policies, and *how* to analyze them. By the end of the course, students will be able to use HANK and THANK frameworks in their own research and critically assess the strengths and limitations of each.

### Assessment

- 40% Problem sets (one empirical and one theoretical application)
- 60% Exam

## Lecture Plan (3 weeks, 18 hours)

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### Week 1: Macroeconomic Policies and Heterogeneity

We begin by motivating heterogeneous-agent models with empirical evidence on heterogeneous MPCs, hand-to-mouth behavior, and balance-sheet exposure in fiscal and monetary transmission (Johnson et al., 2006; Parker et al., 2013; Broda and Parker, 2014; Jappelli and Pistaferri, 2014; Kaplan et al., 2014; Fagereng et al., 2021; Cloyne et al., 2020; Patterson, 2023). We then study the HANK transmission logic through Auclert's decomposition and canonical quantitative applications (Auclert, 2019; Kaplan et al., 2018; Kaplan and Violante, 2018; Auclert, 2025; Auclert et al., 2025). Finally, we contrast this benchmark view with recent papers on insurance, micro versus macro MPCs, wealth effects, labor-supply channels (Bilbiie et al., 2025; Bergholt et al., 2025; Orchard et al., 2025b,a; Ramey, 2025; Cesarini et al., 2017; Auclert et al., 2023; Golosov et al., 2024; Graves et al., 2026; Cantore et al., 2026).

### Week 2: Quantitative HANK and the Sequence-Space Jacobian

We turn to the canonical one-asset HANK model and solve it in Python with the Sequence-Space Jacobian toolkit (Auclert et al., 2021). Starting from the incomplete-markets household block and its iMPC matrix, we show how fiscal transmission can be summarized by the Intertemporal Keynesian Cross and compared across RA, TA, and HANK (Auclert et al., 2024, 2025). We

then compute monetary impulse responses and decompose them into direct rate-exposure and indirect equilibrium-income effects, linking the analysis to the broader quantitative HANK literature (Auclert, 2019; Kaplan et al., 2018; Kaplan and Violante, 2018; Auclert, 2025).

### Week 3: THANK

We conclude by asking how many of the key channels in HANK can be captured by tractable models. We start from the benchmark two-agent TANK model and its early insights, diagnose its failures regarding iMPCs and profit-income incidence (Broer et al., 2020), and discuss how to fix them (Bilbiie, 2008, 2020; Cantore and Freund, 2021). We then derive a general zero-liquidity HANK representation (THANK) and discuss how close it can get to the quantitative HANK model (Ravn and Sterk, 2021; Werning, 2015; McKay et al., 2016; Bilbiie, 2025).

### Learning Outcomes

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By the end of the course, students will be able to:

- Explain how heterogeneity reshapes monetary and fiscal policy transmission.
- Work with sufficient-statistics decompositions.
- Implement and solve a canonical HANK using the SSJ toolbox.
- Derive THANK predictions and compare them with HANK.
- Assess when tractable models suffice and when a full quantitative model is needed.

### Software and Prerequisites

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**Software:** Students are expected to bring their own laptop with Python installed. We will use the Sequence-Space Jacobian toolbox (Auclert et al., 2021).

**Prerequisites:** Graduate macro (dynamic programming, RBC/NK), basic HA models (consumption-savings under incomplete markets), and familiarity with Python.

### Material

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All the material for the course will be available via this [Link](#).

### References

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