Package 'CurricularComplexityData'

February 4, 2026

Title Data for Exploring Curricular Complexity

Version 0.1.0

Description Provides 'igraph' objects representing engineering plans of study across multiple disciplines and institutions. The data are intended for use with the 'CurricularComplexity' package (Reeping, 2026) <https://CRAN.R-project.org/package=CurricularComplexity> to support analyses of curricular structure. The package leverages network analysis approaches implemented in 'igraph' (Csárdi et al., 2025) <doi:10.5281/zenodo.7682609>.

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Encoding UTF-8

RoxygenNote 7.3.3

Depends R (>= 3.5)

Suggests CurricularComplexity

LazyData true

NeedsCompilation no

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Contents

NSF_SUCCESS *NSF SUCCESS Engineering Curricula Networks*

Description

A collection of curricular networks for five engineering disciplines across multiple MIDFIELD institutions in the United States. Each network is an `igraph` object representing courses as nodes and prerequisite/corequisite relationships as directed edges.

Usage

```
NSF_SUCCESS
```

Format

A list of 494 `igraph` objects.

Details

Context: These curricula are from institutions in the Multiple-Institution Database for Engineering Longitudinal Development (MIDFIELD), which contains nearly two million undergraduate student records from 21 U.S. universities spanning 1987-2024. This dataset complements MIDFIELD by capturing curricular structure and complexity as part of the project "Studying Undergraduate Curricular Complexity for Engineering Student Success (SUCCESS)."

Sampling: Curricular plans were collected from 13 MIDFIELD institutions over 10 years for Mechanical, Electrical, Chemical, Civil, and Industrial Engineering programs using institutional websites and the Internet Archive Wayback Machine.

Data structure: The dataset is a list of 494 `igraph` objects. Each object corresponds to a plan of study for a specific discipline, institution, and year. Vertices represent courses with attributes `course_name`, `course_code`, `term`, `credits`, and `notes`. Edges represent prerequisite and corequisite relationships with attribute `type` ("prereq" or "coreq").

Limitations: The dataset focuses on large, research-intensive institutions and five engineering disciplines. Users should exercise caution when extrapolating beyond this scope. Minor data entry errors may exist for older plans of study, but overall trends are robust.

Source

Collected from institutional websites and the Internet Archive Wayback Machine, Fall 2022.

References

Reeping, D., Padhye, S. M., & Rashedi, N. (2023). A process for systematically collecting plan of study data for curricular analytics. In *Proceedings of the 2023 ASEE Annual Conference & Exposition*.

Padhye, S., Reeping, D., & Rashedi, N. (2024). Analyzing trends in curricular complexity and extracting common curricular design patterns. In *Proceedings of the 2024 ASEE Annual Conference & Exposition*.

Reeping, D., Ebrahiminejad, H., Ohland, M., Reid, K., & Rashedi, N. (2026). Analyzing the curricular complexity of engineering programs across disciplines and time. *IEEE Transactions on Education*.

#' Rashedi, N., Reeping, D., Wei, S. (2026). A scoping review of methods used to analyze engineering curricula quantitatively using curricular analytics *Engineering Education Review*.

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