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| **Institution Name:** |  |
| **Institutional Course Name:** |  |
| **Institutional Course Number:** |  |
| **Textbook (if applicable):** |  |

**Mathematical Reasoning & Modeling Institutional Course Alignment Form**

**OVERVIEW:** The purpose of this form is to allow each institution to demonstrate that their math course aligns with the Missouri Math Pathways Initiative and can be included in the general education core curriculum – The Core 42 – as outlined in SB 997, meaning that this course is guaranteed to transfer across all public institutions.

**INSTRUCTIONS:** Please ensure that the institutional course syllabus meets the following Statewide Student Learning Outcomes (SLOs). If your course does not currently meet any of the SLOs below, please indicate in the space provided next to the Statewide SLO how you will work to meet the given SLO in the future. If your course meets the SLO, either mark yes or leave the space blank. Please include a copy of the syllabus.

Once the institutional course has been reviewed and compared against the Statewide SLOs, please sign in the space indicated at the bottom of this cover page and return the completed document (and course syllabus) to David Hewkin at the Missouri Department of Higher Education and Workforce Development ([david.hewkin@dhewd.mo.gov](mailto:david.hewkin@dhewd.mo.gov)).

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| Department Chair Name (print): | |
| Signature: | Date: |

**Mathematical Reasoning & Modeling**

**COURSE OVERVIEW:** *Mathematical Reasoning and Modeling* is a terminal course in mathematics for students in the humanities. Given the variety of college and career paths falling within the humanities, this course may be customized to fit the student needs for a particular postsecondary institution. The proposed student learning outcomes/objectives form a basic course framework that will be enhanced by including additional outcomes/objectives, as needed.

The purpose of this course is to provide a comprehensive overview of the skills required to navigate the mathematical demands of modern life and prepare students for a deeper understanding of information presented in mathematical terms. Emphasis is placed on improving students’ ability to draw conclusions, make decisions, and communicate effectively in mathematical situations that depend upon multiple factors. To that end, students will develop critical thinking and problem solving skills through the following student learning outcomes.

If your course **does not currently meet any of the SLOs below**, please indicate in the space provided how you will work to meet the given SLO in the future. If your course **meets the SLO**, please indicate in the space provided where in the syllabus the SLO is met.

1. **Proportional Reasoning**

Students will draw conclusions or make decisions using proportional reasoning. Specifically, students will be able to:

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| **Statewide SLOs** | **Institutional Student Learning Outcome** |
| *I.A Use ratios, proportions, rates, and percentages to explain, draw conclusions, or make decisions.* |  |
| *I.B Use units and unit conversions to explain, draw conclusions, or make decisions.* |  |

Possible content topics: Ratios, proportions, rates, percentages, units, conversions, absolute and relative change, geometric proportions, etc.

1. **Statistical Reasoning**

Students will read, interpret, analyze, and synthesize quantitative data (e.g., graphs, tables, statistics, survey data, etc.) and make reasoned estimates and inferences. Specifically, students will be able to:

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| **Statewide SLOs** | **Institutional Course Alignment** |
| *II.A Collect and organize data in graphs and tables.* |  |
| *II.B Use descriptive statistics to interpret and analyze quantitative data.* |  |
| *II.C Use probability to interpret and analyze quantitative data.* |  |
| *II.D Communicate statistical findings effectively.* |  |

Possible content topics: Probability, descriptive statistics, visual displays of quantitative information, correlation and causation, etc.

1. **Mathematical Modeling**

Students will create, apply and use mathematical models to solve problems. Specifically, students will be able to:

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| **Statewide SLOs** | **Institutional Course Alignment** |
| *III.A Describe and contrast linear rate and non-linear rate through verbalization and writing* |  |
| *III.B Create linear and non-linear functions from quantitative data and explain the results.* |  |
| *III.C Interpret and analyze linear and non-linear functions that model data.* |  |

Possible content topics: Linear functions, exponential functions, scatterplots and best fit lines, financial math, etc.

**IV. Additional Topics as Determined by Individual Institutions**

Comments: