**Purpose**: This tool is a collection of templates that faculty and administrators can use to prepare for and implement multidisciplinary discussions focused on *identifying a default mathematics course requirement that is most relevant for each program of study*.

**Audience:** This tool is intended for use with a small group that includes mathematics faculty, partner discipline faculty, and related department leadership.

**The tool contains the following parts:**

* Meeting Preparation Advice
* Meeting Agenda Template
* Mathematics Department Discussion Template
* Discipline Team Discussion Template
* Survey of Mathematical Skills
* Sample Timeline and Activities

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| **Meeting Preparation Advice** |
| ***Establish roles.***   * Meeting lead: This person can be someone from either the mathematics department or the departmental team and is responsible for organizing logistics and facilitating agenda. * Math lead: The math lead should have familiarity with the learning outcomes for all entry-level math courses and is responsible for bringing appropriate resources to the discussion. * Discipline team: The discipline team should be prepared to discuss the quantitative skills students in your programs need and the way in which mathematics is used in jobs in your field. * Others?   ***Complete preparation as outlined in the appropriate discussion template.***   * Review either the Mathematics Department Discussion Template or the Discipline Team Discussion Template. * Jot down initial thinking and/or bring available documentation to the discussion. |

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| **Meeting Agenda Template** |
| |  |  |  | | --- | --- | --- | | *5 minutes* | ***Set the charge.*** |  | |  | *Identify shared goal*:   * Work toward identifying a default mathematics course requirement that is most relevant for each program of study.   *Outcome for this specific meeting*:   * Develop a shared understanding of the needs for mathematics in the program(s) of study as well as topics covered in the mathematics courses.   *Establish group norms*:   * Recognize that everyone has expertise. * Honor requests for additional thinking time so everyone can participate. * Use specific examples and agree on definitions. * Presume positive intentions. | | | *10 minutes* | ***Develop common understanding of the context.*** | | |  | * Share relevant student success data for mathematics pathways. * Identify the specific programs of study that will be part of this discussion. | | | *30 – 40 minutes* | ***Develop common understanding mathematical needs for these specific program(s) of study.*** | | |  | * See questions listed in the *Mathematics Department Discussion Template* and the *Discipline Team Discussion Template*. | | | *5 – 10 minutes* | ***Plan future action.*** | | |  | *Reflect on the discussion.*   * What progress has been made toward identifying a default mathematics course? * What additional information is needed to make progress on this decision?   *Identify next steps.*   * Administrative support: What additional supports do you need to move this forward at your institution? * Communication: Who needs to be updated about this discussion? Who should be involved in future discussions? * Responsibility: Who is responsible for organizing future discussions? | | |

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| **Mathematics Department Discussion Template** |
| **Preparation**: Consider bringing the following resources to the meeting.   * Relevant student success data for mathematics pathways. * Examples of the mathematics problems students will encounter in each course. * Illustration of the ways you incorporate the partner discipline into the existing mathematics courses. * Program of Study briefs, recommendations of professional associations, meta-major frameworks, etc. * MAA’s partner discipline reports: MAA (2004). [*The Curriculum Foundations Project Voices of the Partner Disciplines*;](http://www.maa.org/sites/default/files/pdf/CUPM/crafty/curriculum-foundations.pdf) and MAA (2011). [*Partner Discipline Recommendations for Introductory College Mathematics and the Implications for College Algebra*](https://www.maa.org/sites/default/files/pdf/CUPM/crafty/introreport.pdf). * Arkansas’s Math Task Force Report: [*Forging Relevant Mathematics Pathways in Arkansas*](https://dcmathpathways.org/sites/default/files/resources/2018-01/Forging%20Relevant%20Mathematics%20Pathways%20in%20Arkansas%5B1%5D.pdf)   **Discussion:** Develop a shared **understanding** **of the needs** for mathematics in the program of study as well as the **topics covered in the mathematics courses**. Guiding questions include:   * Are students expected to use mathematics in this program of study? * What math skills do partner disciplines assume are currently being taught in the mathematics courses? * What is the responsibility of our institution to mathematically prepare students for 1) academic, 2) career, and 3) civic responsibilities? * Do students in this program wait until their last year to complete their math requirement? * Do students in this program fail to progress towards graduation because of math? * What quantitative learning outcomes are identified as necessary by national professional associations in this field? * What opportunities are there for applying this discipline’s models and problems in the default entry-level math course?   **Notes:** |

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| **Discipline Team Discussion Template** |
| **Preparation:** Describe what your **students need to be quantitatively prepared** for your department’s programs of study.   * What are the mathematical skills used in careers/jobs that students in your discipline go on to pursue? * What are the mathematical skills and abilities that students need to learn in entry-level mathematics courses to prepare for upper-division coursework in your discipline? *The next section, Survey of Mathematical Skills, may be useful here.* * What applications of mathematics do students use most frequently in your discipline? * Do some of your students display “math anxiety” – delay course taking, avoid quantitative assignments, have fixed mindset about math ability, etc.? How can you partner with the math department to address these concerns? * How do you think your discipline’s models and problems could be included in entry-level math courses? * Are there any programs of study in this discipline that have mathematics requirements not shared by other programs in this discipline? * Which of the following best describes how the certificates or degrees in your program connect to future credentials?   + Our credentials are terminal. After our programs, there are no additional certifications or degrees at other institutions.   + Our credentials could lead to additional credentials at other institutions.   **Discussion:** Develop a shared **understanding** **of the needs** for mathematics in the program of study as well as the **topics covered in the mathematics courses.** Guiding questions include:   * Are students expected to use mathematics in this program of study? * What math skills do partner disciplines assume are currently being taught in the mathematics courses? * What is the responsibility of our institution to mathematically prepare students for 1) academic, 2) career, and 3) civic responsibilities? * Do students in this program wait until their last year to complete their math requirement? * Do students in this program fail to progress towards graduation because of math? * What quantitative learning outcomes do national professional associations recommendations in this field identify as necessary? * What opportunities are there for applying this discipline’s models and problems in the default entry-level math course? |

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| **Survey of Mathematical Skills** |
| Which of the following best describe the skills your students need to develop?  Try to limit your select to (at most) five.   * Summarize and interpret data. * Graph a large variety of algebraic functions. * Apply logic and reasoning to solve problems. * Model the real world, especially financial problems, using algebra. * Model the real world using probability. * Apply common probability distributions, such as normal and binomial. * Apply the theory of functions. * Reason using ratio and proportions. * Use functions to model real-world phenomena. * Evaluate all roots of higher degree polynomial and rational functions. * Create and interpret graphical/tabular representations of data. * Draw conclusions based on data. * Apply solution methods for a large variety of algebraic equations. * Apply right triangle trigonometry. * Determine the validity of an argument or statement and provide mathematical evidence. * Recognize, solve and apply systems of linear equations using matrices. * No significant mathematical preparation is required. * Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| **Meeting Preparation Advice** |  |
| Month 1 – Secure mandate from president/provost to achieve the goal. Send communication to deans and department chairs describing the work. Develop survey instrument. |  |
| Month 2 – Have deans and department chairs select a single faculty point of contact. Communicate with all points of contact about expectations and answer any questions about the survey and student learning outcomes. |  |
| Month 3 – Points of contact solicit input from departments during a faculty meeting. Points of contact submit surveys. |  |
| Month 4 – Math leads analyze survey and author a report that includes findings and recommendations. |  |
| Month 5 – Math leads meet with points of contact to finalize decision on default course requirements. |  |
| Month 6 – Communicate with all stakeholders about recommendations. |  |
| Month 7 – Plan meetings with transfer institutions to align programs requirements. Consider connecting partner disciplines from across institutions to address misalignment of math requirements. |  |
| Month 8 (and beyond) – Update degree plans, advising documents, and course catalogs with new information. |  |