

2021_SSP Faculty Projects

Row 5

Research Group	Koch
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Project Title	The Search for Boxes with Integer Dimensions
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Research Question, Hypothesis, or Conjecture	We will try to construct rectangular boxes with integer dimensions, including side lengths, face diagonals, and diagonals through the box.
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Project Description	(See Dr. Koch's attachment as a more math-friendly notation of his project).
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Introductory References	(See Dr. Koch's attachment)
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Project Timeline (weekly), during June 1 - July 31	Wks 1,2: Working through the rectangle problem (to serve as a hands-on introduction) Wks 3-4. Working on the box problem Wks 5-7. Either continue on the box problem or, if needed, jump to one of the other problems outlined in the description. (If necessary, students can work on different but related problems.) Wk 8. Prepare students for presentations and for conference opportunities during AY 2021-22.
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Expected Learning Outcomes	I want the students to understand what it means to do mathematics. It's not doing a calculation: that's what it means to be a computer. I want them to experience fun and frustration simultaneously as they try to solve a problem that is probably impossible to completely solve in 2 months, and I want them to accept it when they don't make great strides. I want them to understand that even tiny steps towards solving a problem are significant achievements, and to value the fact that they know something that no one else in the entire world knows.
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Research Team & Environment	All undergrads. All we need is a room, a chalkboard, determination, and a lot of curiosity.
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Department	Mathematics
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4 or 8 Week Project	8 weeks
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# of full-time student positions requested (1-3)	I would like 3. I can make anything work: x advanced, 3-x novice for x between 0 and 3.
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Minimum Requirements (for research novices)	HS geometry. Really, it's hard to imagine anyone being interested in this project who doesn't at least meet "novice" status.
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Requirements for Advanced students	I would define "advanced" to be someone who has had MAT 204
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Recommended Preparation	
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(but not required)

Modification for Remote Research (IF needed) I did this last year through Zoom. It loses something compared to meeting together in a classroom, but it worked. On benefit is that we had daily notes to refer to!
