Metropolitan Community College
Blue River | Business & Technology | Longview | Maple Woods | Penn Valley

National Science Foundation Grant Opportunity
DISTANCE LEARNING FOR MACHINING
PROJECT EXECUTIVE SUMMARY

Metropolitan Community College in Kansas City, MO (MCC) has an opportunity to apply for a National Science Foundation (NSF) grant to support applied technical education. The District's highly successful Computer Integrated Machining and Manufacturing (CIMM) program educates technicians in the precision machining field and places them in internships/jobs with companies represented in the District's business consortium. The curriculum and degree programs were designed by the business consortium and are overseen by them, but the program currently does not produce enough technicians to satisfy the regional need. The Consortium is requiring MCC to produce more graduates. To increase the number of highly-skilled machining technicians in the Kansas City area, the CIMM program plans to deliver education via video/internet connection to offer entry-level machining classes onsite at rural, participating school districts in the service area (contingent on grant funding). The program's Principal Investigators (PIs) for the grant will develop contextualized math curriculum which can be embedded into these machining courses so that students/graduates are prepared to either enter the workforce or continue working toward a credential or certificate after the participating school district graduation.
This program provides participating school district seniors a pathway to complete an Associate of Applied Science degree at MCC.

MCC Personnel and Leadership

This program will be supported at the district's Business and Technology campus (BT). The Administrator in Charge will be Interim Dean of Instruction, Dr. Crystal Johnson. David Grady will serve as a PI and course instructor. Jennifer Butler, math instructor, will serve as CO-PI and will provide the integrated math curriculum. She will design videos, examples, practice problems, and an assessment for each math skill.

Outcomes

- Students will receive dual credit from participating school district and MCC for the CIMM courses
- Students may receive some high school math credit from the integrated math coursework
- Students have the potential to receive Mill and Lathe Certifications (must take all courses, must have training on CNC machines at MCC in the CIMM 160 Advanced Lathe Operations, must complete summer internship)
- Students have a pathway to complete an AAS degree at MCC, with 1 year completed
- MCC has an opportunity to deliver programming to rural areas that is not currently available
- MCC has an opportunity to respond to an industry need (including building industry partnerships and strengthening secondary partnerships)

Courses to be offered

Fall

•	CIMM 100	Introduction to Machining and Manufacturing	3 credits
•	CIMM 105	Introduction to Blueprint Reading	2 credits
•	CIMM 110	Manual Lathe Operations	3 credits
•	CIMM 121	CNC Lathe Operation Fundamentals	4 credits
		Total fall:	**12 credits**

Spring

- CIMM 160 Advanced Lathe Operations 4 credits
  - Students will need transportation to MCC approx. 6 times to use CNC equipment. One option: Bus students on Saturdays for 4-6 hours each time to access the hands-on experience.
- CIMM 115 Manual Mill 3 credits
- CIMM 122 CNC Mill Operation Fundamentals 4 credits
- COLL 100 First-Year Seminar 1 credit

Total spring: 12 credits

Summer

- CIMM 151 Mill Internship & Co-Op 3 credits

Total summer: 3 credits

Total credits: 27 credits

Costs/Equipment

This paragraph is an overview is based on the successful awarding of NSF grant funding. Students will attend class at their local high school utilizing the space and equipment provided there. MCC will be able to loan a mill and lathe and deliver that equipment to the high school. It is anticipated the grant funding will cover startup costs such as video equipment and distance education support to create the distance delivery and online components, as well as providing for an external evaluator.

Tuition

MCC out-of-district tuition is $183 per credit hour. Participating students will pay 50% tuition rate for out-of-district tuition ($91.50 per credit hour). In addition, there may be lab fees depending on the course and whether MCC or the participating school district provides the course materials.

Timeline

- May 2020: Receive NSF funding (if approved)
- Summer 2020: Install video equipment and conduct equipment testing, build online course
- Fall 2020: Begin program
  (Students should be informed of this potential opportunity in spring of junior year)

NSF Assurance Requirements and Reporting

- All students will take WorkKeys exams as they enter and exit the program. MCC will cover the costs of these exams for the life of the grant. These exams will document math achievement.
- MCC is currently receiving external evaluation consultant proposals. Per NSF, MCC will need to evaluate the implementation and outcomes and provide annual reporting on:
  - student learning
  - retention
  - graduation
  - employment
  - meeting a workforce need
  - enhancing institutional capacity
  - advancing knowledge about technician education.
- The program will create an improvement plan based on summative evaluation results.
- The program will develop a sustainability plan to continue the distance training program.