Please attach/submit additional documents as needed to fully complete each section of the form. See information about Level I Proposals.

**I. DEPARTMENT / PROGRAM**

Industrial Technology / Welding Technology Certificate of Applied Science in Precision Machine Technology

**II. SUMMARY**

A Certificate of Applied Science in Precision Machining Technology as a component of Welding Technology will enhance stackable credentials already in place in the welding program. The stackable credentials will allow students to achieve levels of competency with easy on-ramps and off-ramps. They also make it easier for incumbent workers to increase their skills. Tier I (15 credits) focuses on introductory knowledge and skills critical to manual machining, including mill and lathe work, blueprint reading, and precision measurements and quality control; emphasis is also placed on the cooperation, communication and critical thinking skills needed for dynamic team interactions. Tier II (19 credits) is the further development of the knowledge and technical skills required for employment in industrial machining, including CNC mill and lathe work and CAD/CAM capability essential to CNC machining. Industry recognized credentials from NIMS (National Institute for Metalworking Skills) will be embedded in both Tiers.

The curriculum was designed with extensive input from community manufacturers to enhance the local labor force. Successful completion of the CAS in conjunction with a Welding Technology program complements welding instruction and enhances employability in the welding industry; as a stand-alone credential, the CAS in Precision Machine Technology leads to entry level employment in the machining industry, to apprenticeship, or to further academic development of the knowledge and technical skills required for employment in industrial machining.

Local manufacturers, secondary and post-secondary faculty, and students will provide input into this program by participating as members of a machining advisory board to address topics regarding local workforce development, apprenticeship, and internship opportunities. Local industry partners have already participated in a DACUM study to identify those skills specific to industry needs in the Missoula labor market; specifics from the DACUM will inform our curriculum. Industry experts will partner with Missoula College instructors and serve as student project reviewers for NIMS credentialing.

This Certificate has been created with administrative and financial assistance from the TAACCCT 3 RevUp Montana grant, funded by the U.S. Department of Labor.
IV. ENDORSEMENTS AND APPROVALS

Requestor:
Zachary Reddig
Phone / Email: (406) 243-7644  zachary.reddig@umontana.edu

Program Chair:
William Hillman

Other affected Programs: *

Dean:
Shannon O'Brien
Provost's Office:

* Are affected because of: (a) required courses including prerequisites or corequisites, (b) perceived overlap in content areas, or (c) cross-listing of coursework.

After the Faculty Senate approves the proposal on a consent agenda the Provost's Office forwards the item for Board of Regents approval at the next possible meeting.

V. TYPE OF LEVEL I PROPOSAL

☐ Retitling existing majors, minors, options, or certificates
☐ Eliminating existing majors, minors, or options. (submit with BOR program termination checklist)
☒ Adding new minors or certificates where there is a major or an option in a major *
☐ Campus Certificates: Adding, retitling, terminating or revising a certificate of 29 or fewer credits
☐ Revising a program* (for minor modifications use the program modification form)
☐ Distance or online delivery of previously authorized degree or certificate program
☐ Adding option within an existing major or degree *
☐ Consolidating existing programs and/or degrees *
☐ Placing a program into moratorium
☐ Withdrawing a program from moratorium
☐ Adding BAS/AA/AS Area of Study

*Must submit with BOR Curriculum Proposal Form.
IV. CATALOG LANGUAGE

Attach the current or proposed catalog language with any changes clearly identified.

CURRENT: The mission of the Welding Technology Program is to provide the regional workforce with credentialed, skilled, and competent welders and to be responsive to emerging workforce needs. The Welding Technology Program prepares students to operate and troubleshoot a variety of welding power sources and related equipment. The program prepares students to solve problems found within the welding industry using computational skills and other problem-solving techniques essential to welding and steel fabrication. It also encourages the development of teamwork and interpersonal skills required on the job.

Welding students develop skills in six different welding processes—oxyacetylene (OAW), shielded metal arc (SMAW), gas metal arc (GMAW), flux core arc, (FCAW), submerged arc (SAW), and gas tungsten arc welding (GTAW). Beyond the development of welding skills and understanding of the process, they also study other skills, such as blueprint reading and layout, metallurgy, and gain an understanding of how heating and cooling cycles affect the properties of metals. Students also study the design of jigs and fixtures and how to incorporate these into an automated welding system.

The Welding Technology Program also has courses that provide for a solid background in the metals industry. Such courses are Computer Aided Design and Drafting (CADD), OSHA Rules and Compliance, and Related Metals Processes. Fabrication basics and Metal Design and Construction utilize all of the gained knowledge with an instructor approved/student designed project.

Welding technology students have the opportunity to become certified to American Welding Society Standards and receive documentation stating qualifications.

Students are awarded the Certificate of Applied Science upon successful completion of the first year of the Welding Technology program. Students are awarded the Associate of Applied Science degree upon successfully completing the two-year program.

PROPOSED (ADD): The mission of the Welding Technology Program is to respond to emerging workforce needs by providing the regional workforce with credentialed, skilled, and competent metalworkers, including welders and entry level machinists.

The Associate of Applied Science in Welding Technology prepares students to operate and troubleshoot a variety of welding power sources and related equipment and to solve problems found within the welding industry using computational skills and other problem-solving techniques essential to welding and steel fabrication. Students develop teamwork and interpersonal skills required on the job. Welding students develop skills in six different welding processes—oxyacetylene (OAW), shielded metal arc (SMAW), gas metal arc (GMAW), flux core arc, (FCAW), submerged arc (SAW), and gas tungsten arc welding (GTAW). Beyond the development of welding skills and understanding of the process, they also study other skills, such as blueprint reading and layout, metallurgy, and they gain an understanding of how heating and cooling cycles affect the properties of metals. Students study the design of jigs and fixtures and incorporate these into an automated welding system. Fabrication basics and Metal Design and Construction utilize all of the gained knowledge with an instructor approved/student designed project. Welding technology students have the opportunity to become certified to American Welding Society Standards and receive documentation stating qualifications.
Students are awarded the Certificate of Applied Science in Welding Technology upon successful completion of the first year of the welding program. Students are awarded the Associate of Applied Science in Welding Technology upon successfully completing the two-year program.

The Precision Machine Technology CAS will enhance students' metalworking skills by offering specific knowledge and practice in the theory and operation of mills and lathes and other tools related to the machinist trade, and associated programming. Successful students will earn National Institute for Metalworking Skills (NIMS) certifications as well as a Certificate of Technical Studies after one semester or a Certificate of Applied Science upon successful completion of two semesters. The Certificates complement the AAS or CAS in Welding Technology and should increase employability in the metalworking industry; standing alone, the machining credentials will provide knowledge and skills to gain entry into machining industry, apprenticeship, or further study in metalworking.

III. JUSTIFICATION

Growth in the manufacturing industry and the need to replace an aging workforce is expected to provide opportunities for graduates. According to the Montana Department of Labor & Industry, Research and Analysis Bureau, growth in the machining industry from 2012 – 2022 is predicted to be 18%, or 30 jobs annually. Both state and national projected employment growth exceeds the rate of overall projected employment growth. Local industry demand for trained workers has been confirmed by discussions with Missoula Job Service staff, Missoula Economic Partnership staff, and owners/managers of local machining endeavors.

Manual and CNC machinists work in machinery and machine tool manufacturing, small arms manufacturing, and machine shops. Entry level machinists in Missoula, Montana can earn as much as $16.00 per hour, according to Bureau of Labor Statistics, Occupational Employment Statistics Program. Manual machinists may enter at a lower wage and work their way to journey level competencies as apprentices. Industrial representatives state that with a larger trained workforce, they could drastically increase their output and ability to serve industries that rely on their products, including the oil and gas industry, aerospace, and others.

VI SUBMISSION

Submit the complete Level I proposal to the Provost’s Office for initial review. After all signatures have been obtained, submit original, and an electronic file to the Faculty Senate Office, UH 221, camie.foos@msou.umt.edu
Level 1 proposals also require Board of Regents approval. The appropriate BOR forms must be submitted with this form.