

Aerospace Machining

Course Outline

Outline:

This course prepares students ages 18-21 to successfully earn their Manitoba Apprenticeship Level 1 Machinist Certification. The introductory training provides students with foundational aerospace manufacturing skills, ensuring they are equipped to gain employment in the aerospace manufacturing and machining industry. Only students who meet Apprenticeship Manitoba Accreditation requirements will receive a Level 1 Apprenticeship Certification. All training will occur at 1555 Wall Street Winnipeg, Manitoba, Canada.

Student Requirements:

- All student absences must be recouped during lunch periods or non-regularly scheduled instructional time.
- 70% for all projects and assessment is the minimum passing standard. Students will be given the opportunity to be reassessed when required.
- Students must have CSA work shoes/boots, binder, paper, calculator and pens/pencils. All other PPE will be provided to the students.
- Students will be responsible for completing and submitting a Child Abuse Registry Check prior to the first day of school.
- All Technical Vocational High School and Winnipeg School Division student requirements and protocol will be applicable to all students enrolled.

Program Credits:

This program combines a total of 8 credits.

Description	Course Code(s)	Credits
Machining Technology: Manitoba Education Curriculum combined with Apprenticeship Manitoba Machining Level 1 Curriculum	• MT8842V2S- (8842) Bench Metal • MT8843V3S- (8843) Drill Press and Metal Cutting Saws • MT8844V3S- (8844) Lathe Operations and Grinding 1 • MT8854V3S- (8854) Milling Operations I • MT8855V4S- (8855) Lathe Operations and Grinding II • MT8856V4S- (8856) Milling Operations II • MT8857V4S- (8857) Applied Machining and Manufacturing Technology • MT8858V4S- (8858) CNC Machining	8 (880 hrs)
Life Works: Work Experience Credit (3 weeks)	• LWTR4S- Applied Work Experience This will be a 3-week work experience performed at one of our aerospace manufacturing industry partners.	1 (110 hrs)
TOTAL CREDITS:		9

Course and Curriculum:

Course Code	Description	Credits
8842 Bench Metal 20S/20E/20M	Students will develop fundamental skill sets using cutting and non-cutting hand tools, precision measurement, layout and drilling techniques. These skill sets will be developed through performing practical projects and exercises.	1
8843 Drill Press and Metal Cutting Saws 30S/30E/30M	Students will develop skill sets to safely and accurately operate a drill press, horizontal and vertical bandsaws. Emphasis is placed upon use and maintenance of sharp cutting tools, development of accuracy to produce a quality part, and the respect of safety rules for all machine tools.	1
8844 Lathe Operations and Grinding I 30S/30E/30M	Students develop skills and knowledge necessary to select, operate, and maintain tools, as well as to perform calculations, interpret engineering drawings, work set-up, and machine material in a safe, efficient, and responsible manner through the application of practical projects related to the operation of the conventional lathe. Students will develop the skills necessary to set-up and perform machining of cylindrical parts to precise measurements using appropriate tools, speeds, and feed rates. Use of various work-holding devices and accessories is put into practice to complete common lathe operations.	1
8854 Milling Operations I 30S/30E/30M	Students develop skills and knowledge necessary to select, operate, and maintain tools, as well as perform calculations, interpret engineering drawings, work set-up, and machine material in a safe, efficient, and responsible manner through the application of practical projects related to the milling machine. Students will develop the skills necessary to safely perform set-up and machining of flat features and angles to precise measurements using appropriate tools, speeds, and feed rates. Use of various work-holding devices and accessories are put into practice to complete common milling operations.	1
8855 Lathe Operations and Grinding II 40S/40E/40M	Students will further develop their lathe operation abilities and skill and gain the ability to perform taper calculations, taper turning and internal/external threading. Identification, selection, and use of carbide insert cutting tools, knurling tools and threading tools. Offhand grinding is taught to shape and maintain high-speed steel cutters for use in general or special turning applications.	1
8856 Milling Operations II 40S/40E/40M	Students will further develop their skills to set-up of the milling machine accessories and work-holding devices, the dividing head, and rotary table, to assist in the machining of accurate parts. Exploration of how to troubleshoot machining problems when they occur is introduced.	1
8857 Applied Machining and Manufacturing Technology 40S/40E/40M	Students apply their skills and knowledge to machine projects in a safe, efficient, and responsible manner to industry standards using available machine shop tools. Emphasis is placed upon preparing students to meet the level of skill and knowledge expected of a first-year apprentice.	1
8858 CNC Machining 40S/40E/40M	Students develop skills and knowledge necessary to select, operate, and maintain tools, as well as perform calculations, interpret engineering drawings, work set-up, and cut material in a safe, efficient, and responsible manner through the application of practical projects related to CNC machining. Students will also gain the ability to use CAM and CAD software along with CNC G-Code to create, edit and modify machining programs.	1
Aerospace Industry Employability Skills	This unit will provide students with training/certification in the following aerospace industry related required certification, pass standards and knowledge which will assist the student in gaining employment: • Human Factors • Industry Regulations (TCA/CARS) • Hierarchy of Technical Data	N/A

Curriculum References:

Manitoba Education Machining Technology: <https://www.edu.gov.mb.ca/k12/cur/teched/sytep/machining/index.html>
 Apprenticeship Manitoba: <https://www.gov.mb.ca/aesi/apprenticeship/discover/mbtrades/machinist.html>