Grades 9 to 12 Aircraft Maintenance Technology

Manitoba Curriculum Framework of Outcomes

2014

Manitoba Education and Advanced Learning

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Technical-Vocational Education Overview

In 2013, Manitoba Education released the document *Technical-Vocational Education Overview* to provide the philosophical and pedagogical underpinnings for curriculum development and the teaching of courses in the Senior Years Technology Education Program.

This overview presents educators with the vision and goals of technical-vocational education (TVE) in Manitoba. Topics include the following:

- curriculum revitalization and renewal
- curriculum framework and implementation
- articulation of programming
- assessment and reporting
- safety
- employability/essential skills and career development
- sustainable development

The TVE curriculum includes Grades 9 to 12 courses in a variety of areas, including aircraft maintenance technology.

Aircraft Maintenance Technology Overview

Grades 9 to 12 Aircraft Maintenance Technology: Manitoba Technical-Vocational Curriculum Framework of Outcomes identifies the goals, general learning outcomes (GLOs), and specific learning outcomes (SLOs) for nine aircraft maintenance technology courses. This framework is intended for use in all Manitoba schools teaching aircraft maintenance technology courses as part of the Senior Years Technology Education Program.

The series of courses in aircraft maintenance technology differs from other TVE subject areas in that each course is quite independent of the others, so some GLOs apply only to some courses. For this reason, rather than displaying the course outcomes side by side in a chart, as the other TVE framework documents do, this document outlines the goals and learning outcomes for each course individually.

The high school aircraft maintenance technology courses provide students with an introduction to the knowledge and skills associated with the maintenance of both large and small airplanes and helicopters. Time in the program is split between the study of aircraft maintenance theory and practical tasks, including work on actual aircraft. Students apply problem-based learning that integrates safety, science, technology, engineering, and mathematics.

Aircraft maintenance technology students use tools, materials, processes, and resources to create solutions and opportunities for themselves and others. Topics include the following:

- principles of flight (both fixed and rotary)
- aircraft engines (both piston and gas turbine)
- aircraft ground handling
- aircraft drawings and documents
- aircraft structures and materials
- aircraft hardware
- aircraft structural repair
- aircraft systems
- aviation math and physics
- sheet metal fabrication and repair
- work experience

To be successful, students in aircraft maintenance technology courses must be able to

- display the ability to safely utilize the wide variety of tools and equipment with a high level of accuracy and proficiency
- solve mathematical problems quickly and accurately when measuring and laying out materials
- select materials, and plan sequences and methods of work
- cut and shape materials, and join them with fasteners and adhesives
- check completed work to ensure compliance to industry standards
- demonstrate employability skills

Implementation of Aircraft Maintenance Technology

To receive a Senior Years Technology Education diploma, a student must complete the minimum of eight mandatory courses in aircraft maintenance technology. The grade level in which the courses are offered is a local school-based decision. It is highly recommended that the sequencing of credits follow the schedule set out at the end of this introduction.

Cross-curricular learning outcomes, or essential skills from subject areas including, but not limited to, information and communication technologies, science, English language arts, and mathematics, are to be integrated into the authentic learning activities of the courses. Learning outcomes dealing with the following topics are also integrated into most courses:

- health and safety
- sustainability

- ethical and legal standards
- employability skills
- career opportunities
- evolution, technological progression, and emerging trends

In most courses, the emphasis is on applied learning activities. For instructional purposes, the sequence of learning outcomes can vary based on the learning activities within the course. Teachers are advised to select the learning activities best suited to teach the learning outcomes, based on a variety of factors, such as access to resources or regional needs.

The curriculum is not sequential. In other words, learning outcomes might be taught in an order different from how they appear in this document.

In light of rapid changes in technology, teachers are encouraged to update learning activities in order to meet the needs of students.

Level 1 Apprenticeship for Aircraft Maintenance Journeyperson

The specific learning outcomes in the eight mandatory courses include all of the objectives found in the Aircraft Maintenance Journeyperson (AMJ) curriculum, from Apprenticeship Manitoba, thereby meeting the curricular requirements for Level 1 AMJ. In some cases, the Apprenticeship objectives have been reworded to make them more consistent with the frameworks or more appropriate for high school students.

In order to teach the courses in this framework, teachers must refer to the Aircraft Maintenance Journeyperson (AMJ) curriculum documents and reference materials.

The AMJ curriculum documents provide necessary, detailed information and clarification of this high school framework's learning outcomes. Teachers must teach all of the objectives and content found in the AMJ curriculum documents and reference materials that are referenced in this framework of outcomes.

Aircraft maintenance technology programs delivering the eight mandatory courses may be eligible for accreditation with Apprenticeship Manitoba. More information on accreditation can be found here: <www.gov.mb.ca/tce/apprent/educator/apprenticeship_school.html>.

Students obtaining an average of 70 percent or higher in each of the eight mandatory courses in an accredited AMJ program may have met the requirements for their Level 1 AMJ.

Trade Safety Awareness Manual

Apprenticeship Manitoba has developed a Trade Safety Awareness Unit, the purpose of which is to increase student awareness of trade safety in the workplace. All students, including those in high school, studying a designated trade must complete this seven-hour unit. The learning outcomes from the Trade Safety Awareness Unit have been incorporated into Goal 1 of this curriculum. For more information, and to access the Trade Safety Awareness Unit and its tests and other resources, please visit <www.gov.mb.ca/tce/apprent/apprentice/trade_safety/>.

Career and Employment Opportunities

Students who have completed the aircraft maintenance technology courses can seek entry-level employment in an aviation and aerospace manufacturing or maintenance facility in a variety of positions.

Students can also continue on into post-secondary or apprenticeship in a variety of related areas. The opportunities range from technician to licensed personnel.

In addition, some related fields that students can enter upon completion of the program include the following:

- transportation trades and manufacturing
- engineering
- non-destructive testing
- electronics
- manufacturing technology
- aerospace component manufacturing, maintenance, and overhaul
- avionics
- aerospace structures
- composites
- engine technology

Aircraft Maintenance Technology Goals and General Learning Outcomes

Curriculum goals outline the major curriculum goals in addition to the general or across-the-curriculum learning goals for the subject area.

The aircraft maintenance technology curriculum includes 14 course goals, which are broken down into general learning outcomes (GLOs), which are broken down into specific learning goals (SLOs). **Please note that some aircraft maintenance technology courses do not address all of these goals.**

Goal 1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

- **GLO 1.1:** Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.
- **GLO 1.2:** Demonstrate knowledge of the *Trade Safety Awareness Manual*.

Goal 2: Demonstrate the safe and appropriate **use and maintenance of equipment and tools**.

- **GLO 2.1:** Demonstrate the safe and appropriate **use of equipment and tools**.
- **GLO 2.2:** Demonstrate the safe and appropriate **cleaning, maintenance, and management of equipment and tools.**

Goal 3: Demonstrate an understanding of the **principles of flight** as they apply to aircraft maintenance technologies.

- **GLO 3.1:** Demonstrate an understanding of **aerodynamics, control, and stability** in fixed- and rotary-wing aircraft.
- **GLO 3.2:** Demonstrate an understanding of **weight and balance.**

Goal 4: Demonstrate an understanding of the major components of aircraft **propulsion systems** and their functions.

- **GLO 4.1:** Demonstrate an understanding of **propellers.**
- **GLO 4.2:** Demonstrate an understanding of **reciprocating engines.**
- **GLO 4.3:** Demonstrate an understanding of **turbine engines.**

Goal 5: Demonstrate an understanding of **aircraft ground handling**.

- **GLO 5.1:** Demonstrate an understanding of **aircraft ground handling.**

Goal 6: Demonstrate an understanding of **aircraft structures and materials.**

- **GLO 6.1:** Demonstrate an understanding of **aircraft structure types.**
- **GLO 6.2:** Demonstrate an understanding of the **materials** used in aircraft.
- **GLO 6.3:** Demonstrate the appropriate use of **fasteners** used in aircraft maintenance technology.

Goal 7: Demonstrate an understanding of aircraft **structural repair.**

- **GLO 7.1:** Demonstrate an understanding of aircraft **structural repair.**

Goal 8: Demonstrate an understanding of **aircraft systems.**

- **GLO 8.1:** Demonstrate an understanding of **hydraulic and pneumatic systems.**
- **GLO 8.2:** Demonstrate an understanding of aircraft **fuel systems.**
- **GLO 8.3:** Demonstrate an understanding of aircraft **landing gear.**

Goal 9: Describe and apply the transferable **cross-curricular knowledge and skills** that relate to aircraft maintenance technology.

- **GLO 9.1: Read, interpret, and communicate information** relevant to aircraft maintenance technology.
- **GLO 9.2:** Demonstrate competence in the use of **mathematics** required for aircraft maintenance technology.
- **GLO 9.3:** Demonstrate competence in the use of the **physics** required in aircraft maintenance technology.
- **GLO 9.4:** Apply **drafting** knowledge and skills.

Goal 10: Demonstrate awareness of **sustainability** as it pertains to aerospace technology.

- **GLO 10.1:** Describe the impact of aerospace technology on the **health and well-being** of aerospace technologists and those who use their products.
- **GLO 10.2:** Describe the aerospace technology industry's **sustainability practices** and **impact on the environment**.
- **GLO 10.3:** Describe **sustainable business practices** within the aerospace industry.

Goal 11: Demonstrate awareness of the **ethical and legal standards** pertaining to aerospace technology.

- **GLO 11.1:** Practise the **ethical and legal standards** pertaining to aerospace technology.

Goal 12: Demonstrate **employability skills.**

- **GLO 12.1:** Demonstrate fundamental **employability skills.**
- **GLO 12.2:** Demonstrate an understanding of the **business operation** of aircraft maintenance organizations.

Goal 13: Understand the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

- **GLO 13.1:** Describe the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

Goal 14: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

- **GLO 14.1:** Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

Specific Learning Outcomes

Grades 9 to 12 Aircraft Maintenance Technology: Manitoba Technical-Vocational Curriculum Framework of Outcomes identifies specific learning outcomes for use in all Manitoba schools teaching the Grades 9 to 12 aircraft maintenance technology courses as part of the Senior Years Technology Education Program. Specific learning outcome statements define what students are expected to achieve by the end of a course.

Some of the SLOs include an alphanumeric reference, such as *(AME 19.G17.1)*, at the end. This refers to a specific subject (for example, 19 is Weight and Balance) and competency of the Aircraft Maintenance Engineer curriculum, which is the basis of the Level 1 Apprenticeship Maintenance Journeyperson curriculum.

It is essential that students learn safety practices and employability skills; therefore, some SLOs related to safety and employability skills are repeated from course to course.

Course Descriptions

Course titles, descriptions, and codes for the nine aircraft maintenance technology courses follow. For an explanation of the codes, refer to the *Subject Table Handbook: Technology Education: Student Records System and Professional School Personnel System* or *Senior Years Course Identification* (Manitoba Education and Advanced Learning).

8405 Exploring Aircraft Maintenance Technology — 15S/15E/15M 10S/10E/10M

Exploring Aircraft Maintenance Technology is an optional half-credit or full-credit course. It is intended for students wishing to sample aircraft maintenance technology. Curriculum content focuses on an exploration of maintenance of aircraft. The emphasis will be on project-based activities.

8527 Introduction to Aircraft Maintenance Technology — 20S/20E/20M

Introduction to Aircraft Maintenance Technology is intended for students wishing to investigate aircraft maintenance technology. Curriculum content focuses on the maintenance of aircraft. The emphasis will be on project-based activities.

8528 Aircraft Engines 30S/30E/30M

Aircraft Engines is intended for students considering specialization in aircraft maintenance technology. Curriculum content focuses on turbine and reciprocating engines, including hands-on activities with engines. Topics include engine components and theory of operation.

8529 Aircraft Ground Handling 30S/30E/30M

Aircraft Ground Handling is intended for students continuing in the specialization phase of aircraft maintenance technology. Curriculum content focuses on an introduction to aircraft ground handling, and the mathematics and physics relevant to aircraft maintenance technology. Topics include safely performing ground handling and servicing of aircraft, and selecting and using appropriate fire extinguishers for fire suppression.

8530 Aircraft Drawings and Documents 30S/30E/30M

Aircraft Drawings and Documents is intended for students completing the specialization phase of aircraft maintenance technology. Curriculum content focuses on an introduction to the drawings and documents used in aircraft maintenance. Topics include reading and interpreting common types of aircraft technical drawings encountered in day-to-day aircraft maintenance and repair, and creating sketches and/or drawings that accurately transmit technical information, as well as reading and interpreting documents.

8531 Aircraft Structures and Materials 40S/40E/40M

Aircraft Structures and Materials is intended for students entering the transition phase of aircraft maintenance technology. Curriculum content focuses on a description of metallic and non-metallic structures. Topics include types of aircraft structures, including materials.

8532 Aircraft Hardware 40S/40E/40M

Aircraft Hardware is intended for students in the transition phase of aircraft maintenance technology. Curriculum content focuses on an introduction to threaded and non-threaded fasteners and plumbing. Topics include the selection and installation of aircraft hardware and ensuring that installed hardware is certified and traceable.

8533 Aircraft Structural Repair 40S/40E/40M

Aircraft Structural Repair is intended for students in the transition phase of aircraft maintenance technology. Curriculum content focuses on an introduction to repairing the structures of aircraft. Topics include the maintenance of aircraft metallic and non-metallic structures including hands-on projects.

8534 Aircraft Systems 40S/40E/40M

Aircraft Systems is intended for students transitioning from Aircraft maintenance technology. Curriculum content focuses on an overview of the maintenance of the systems found in aircraft. Topics include fuel systems, landing gear, and hydraulic and pneumatic systems.

Curriculum Implementation Dates

During the **Voluntary Implementation** year, teachers in Manitoba have the *option* of teaching the new, draft curriculum the year before it is mandatory. They also have the choice to continue to teach the old curriculum during that year. Course codes for the new courses will be available. Course codes are found in the *Subject Table Handbook: Technology Education*.

Under **System-Wide Implementation**, teachers in Manitoba teach the new curriculum. Teachers will no longer be able to use the old codes.

Date	Voluntary Implementation	System-Wide Implementation
Fall 2013	Grade 9 (optional)	
Fall 2014	Grade 10	Grade 9 (optional)
Fall 2015	Grade 11	Grade 10
Fall 2016	Grade 12	Grade 11
Fall 2017		Grade 12

8504
Exploring Aircraft Maintenance Technology (9)

15S/15E/15M
10S/10E/10M

An Aircraft Maintenance Technology Course

8504: Exploring Aircraft Maintenance Technology (9) 15S/15E/15M 10S/10E/10M

Course Description

Exploring Aircraft Maintenance Technology is an optional half-credit or full-credit course. It is intended for students wishing to sample aircraft maintenance technology. Curriculum content focuses on an exploration of maintenance of aircraft. The emphasis will be on project-based activities.

For instructional purposes, the sequence of learning outcomes can vary based on the learning activities within the course. Teachers are advised to select the learning activities best suited to teach the learning outcomes, based on a variety of factors, such as access to resources or regional needs.

The curriculum is not sequential. In other words, learning outcomes might be taught in an order different from how they appear in this document.

In light of rapid changes in technology, teachers are encouraged to update learning activities in order to meet the needs of students.

Please note that some aircraft maintenance technology courses do not address all of these goals.

Goal 1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

GLO 1.1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

SLO 9.1.1.1 Describe and apply appropriate health and safety practices for aircraft maintenance technology.

GLO 1.2: Demonstrate knowledge of the *Trade Safety Awareness Manual*.

No applicable SLOs.

Goal 2: Demonstrate the safe and appropriate **use and maintenance of equipment and tools.**

GLO 2.1: Demonstrate the safe and appropriate **use of equipment and tools.**

SLO 9.2.1.1 Demonstrate the safe and appropriate use of equipment and tools used in aircraft maintenance technologies.

GLO 2.2: Demonstrate the safe and appropriate **cleaning, maintenance, and management of equipment and tools.**

SLO 9.2.2.1 Demonstrate the safe and appropriate cleaning, maintenance, and management of equipment and tools.

Goal 3: Demonstrate an understanding of the **principles of flight** as they apply to aircraft maintenance technologies.

GLO 3.1: Demonstrate an understanding of **aerodynamics, control, and stability** in fixed- and rotary-wing aircraft.

SLO 9.3.1.1 Describe properties of the atmosphere. (AME 8.G9.1)

SLO 9.3.1.2 Explain how lift is generated and affected. (AME 8.G9.2)

SLO 9.3.1.3 Explain how control and stability are achieved for aircraft in flight. (AME 8.G9.3)

SLO 9.3.1.4 Describe aircraft structures and construction. (AME 8.A11.1)

SLO 9.3.1.5 Explain aerodynamic terminology of rotary-wing aircraft. (AME 9.G10.1)

SLO 9.3.1.6 Describe forces acting on various helicopter rotor systems. (AME 9.G10.3)

SLO 9.3.1.7 Describe rotary-wing flight control systems. (AME 9.G10.5)

GLO 3.2: Demonstrate an understanding of **weight and balance.**

SLO 9.3.2.1 Discuss the rationale for understanding weight and balance in aircraft.

Goal 4: Demonstrate an understanding of the major components of aircraft **propulsion systems** and their functions.

GLO 4.1: Demonstrate an understanding of **propellers.**

SLO 9.4.1.1 Identify the function of propellers.

GLO 4.2: Demonstrate an understanding of **reciprocating engines.**

SLO 9.4.2.1 Identify aircraft engine types.

GLO 4.3: Demonstrate an understanding of **turbine engines.**

No applicable SLOs.

Goal 5: Demonstrate an understanding of **aircraft ground handling**.

GLO 5.1: Demonstrate an understanding of **aircraft ground handling.**

No applicable SLOs.

Goal 6: Demonstrate an understanding of **aircraft structures and materials.**

GLO 6.1: Demonstrate an understanding of **aircraft structure types.**

No applicable SLOs.

GLO 6.2: Demonstrate an understanding of the **materials** used in aircraft.

SLO 9.6.2.1 Demonstrate the appropriate handling and management of materials used in aircraft maintenance technology.

GLO 6.3: Demonstrate the appropriate use of **fasteners** used in aircraft maintenance technology.

No applicable SLOs.

Goal 7: Demonstrate an understanding of aircraft **structural repair.**

GLO 7.1: Demonstrate an understanding of aircraft **structural repair.**

No applicable SLOs.

Goal 8: Demonstrate an understanding of **aircraft systems.**

GLO 8.1: Demonstrate an understanding of **hydraulic and pneumatic systems.**

No applicable SLOs.

GLO 8.2: Demonstrate an understanding of aircraft **fuel systems.**

No applicable SLOs.

GLO 8.3: Demonstrate an understanding of aircraft **landing gear.**

No applicable SLOs.

Goal 9: Describe and apply the transferable **cross-curricular knowledge and skills** that relate to aircraft maintenance technology.

GLO 9.1: **Read, interpret, and communicate information** relevant to aircraft maintenance technology.

No applicable SLOs.

GLO 9.2: Demonstrate competence in the use of **mathematics** required for aircraft maintenance technology.

SLO 9.9.2.1 Demonstrate an understanding of measurement.

GLO 9.3: Demonstrate competence in the use of the **physics** required in aircraft maintenance technology.

No applicable SLOs.

GLO 9.4: Apply **drafting** knowledge and skills.

No applicable SLOs.

Goal 10: Demonstrate awareness of **sustainability** as it pertains to aerospace technology.

GLO 10.1: Describe the impact of aerospace technology on the **health and well-being** of aerospace technologists and those who use their products.

No applicable SLOs.

GLO 10.2: Describe the aerospace technology industry's **sustainability practices** and **impact on the environment**.

No applicable SLOs.

GLO 10.3: Describe **sustainable business practices** within the aerospace industry.

No applicable SLOs.

Goal 11: Demonstrate awareness of the **ethical and legal standards** pertaining to aerospace technology.

GLO 11.1: Practise the **ethical and legal standards** pertaining to aerospace technology.

No applicable SLOs.

Goal 12: Demonstrate **employability skills.**

GLO 12.1: Demonstrate fundamental **employability skills.**

SLO 9.12.1.1 Demonstrate the skills required to work as part of a team.

SLO 9.12.1.2 Demonstrate problem-solving skills.

SLO 9.12.1.3 Communicate clearly and respectfully.

SLO 9.12.1.4 Demonstrate regular attendance and punctuality.

SLO 9.12.1.5 Take responsibility for own actions.

SLO 9.12.1.6 Follow directions.

SLO 9.12.1.7 Stay on task.

SLO 9.12.1.8 Dress appropriately for the workplace.

GLO 12.2: Demonstrate an understanding of the **business operation** of aircraft maintenance organizations.

No applicable SLOs.

Goal 13: Understand the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

GLO 13.1: Describe the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

SLO 9.13.1.1 Describe the evolution of the aerospace industry, including its technological progression and emerging trends.

SLO 9.13.1.2 Demonstrate an understanding of the history of the evolution of aircraft.

Goal 14: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

GLO 14.1: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

SLO 9.14.1.1 Describe career opportunities in aerospace.

8527
Introduction to Aircraft Maintenance Technology (10)

20S/20E/20M

An Aircraft Maintenance Technology Course

8527: Introduction to Aircraft Maintenance Technology (10) 20S/20E/20M

Course Description

Introduction to Aircraft Maintenance Technology is intended for students wishing to investigate aircraft maintenance technology. Curriculum content focuses on the maintenance of aircraft. The emphasis will be on project-based activities.

For instructional purposes, the sequence of learning outcomes can vary based on the learning activities within the course. Teachers are advised to select the learning activities best suited to teach the learning outcomes, based on a variety of factors, such as access to resources or regional needs.

The curriculum is not sequential. In other words, learning outcomes might be taught in an order different from how they appear in this document.

In light of rapid changes in technology, teachers are encouraged to update learning activities in order to meet the needs of students.

Please note that some aircraft maintenance technology courses do not address all of these goals.

Goal 1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

GLO 1.1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

SLO 10.1.1.1	Describe and apply appropriate health and safety practices for aircraft maintenance technology.

GLO 1.2: Demonstrate knowledge of the *Trade Safety Awareness Manual*.

SLO 10.8.3.1	Explain the importance of trade safety and health in reducing injuries and fatalities to young employees in Manitoba. (TSA 1)
SLO 10.8.3.2	Describe the rights and responsibilities of employees, employers, and supervisors under *The Workplace Safety and Health Act*. (TSA 2)
SLO 10.8.3.3	Describe the steps to use in the Right to Refuse process. (TSA 3)
SLO 10.8.3.4	Explain how and where to find information on workplace safety and health. (TSA 4)

SLO 10.8.3.5	Demonstrate how to handle a potentially dangerous work situation. (TSA 5)
SLO 10.8.3.6	Explain the S.A.F.E. acronym. (TSA 6)
SLO 10.8.3.7	Define workplace safety and health hazards. (TSA 7)
SLO 10.8.3.8	Give examples of trade-specific (aircraft maintenance) workplace safety and health hazards. (TSA 8)
SLO 10.8.3.9	Give examples of five types of safety and health hazards. (TSA 9)
SLO 10.8.3.10	Define workplace safety and health risk. (TSA 10)
SLO 10.8.3.11	Give examples of trade-specific (aircraft maintenance) workplace safety and health risks. (TSA 11)
SLO 10.8.3.12	Explain the principles of hazard recognition and control as they apply to aircraft maintenance. (TSA 12)
SLO 10.8.3.13	Explain the Workplace Hazardous Material Information System (WHMIS). (TSA 13)
SLO 10.8.3.14	Match the WHMIS hazardous materials symbols and their meanings. (TSA 14)
SLO 10.8.3.15	Describe the importance of the Material Safety Data Sheets (MSDS). (TSA 15)
SLO 10.8.3.16	Describe the importance of using personal protective equipment (PPE). (TSA 16)
SLO 10.8.3.17	Demonstrate proper selection and use of a variety of personal protective equipment and fall protection systems. (TSA 17)
SLO 10.8.3.18	Outline the safety principles for working on and around electrical equipment. (TSA 18)
SLO 10.8.3.19	Outline workplace fire safety principles. (TSA 19)
SLO 10.8.3.20	Identify the hazards in confined spaces and the preparation needed to work in a confined space. (TSA 20)

Goal 2: Demonstrate the safe and appropriate **use and maintenance of equipment and tools.**

GLO 2.1: Demonstrate the safe and appropriate **use of equipment and tools.**

SLO 10.2.1.1	Demonstrate the safe and appropriate use of equipment and tools used in aircraft maintenance technologies.
SLO 10.2.1.2	Demonstrate adherence to safety procedures when using hand and machine tools. (AME 3.G6.1)
SLO 10.2.1.3	Demonstrate correct and safe use of cutting tools used in repair and maintenance of aircraft. (AME 3.G6.2)

SLO 10.2.1.4	Demonstrate correct selection and safe use of mechanical and electrical assembly tools. (AME 3G6.3)
SLO 10.2.1.5	Explain safe use of power and abrasive tools. (AME 3.G6.4)
SLO 10.2.1.6	Explain use of micrometers. (AME 3.G8.1)
SLO 10.2.1.7	Explain the use and care of vernier callipers. (AME 3.G8.2)
SLO 10.2.1.8	Describe use and care of bore and dial gauges. (AME 3.G8.3)
SLO 10.2.1.9	Explain use of comparators and use miscellaneous instruments. (AME 3.G8.4)

GLO 2.2: Demonstrate the safe and appropriate **cleaning, maintenance, and management of equipment and tools.**

SLO 10.2.2.1	Demonstrate the safe and appropriate cleaning, maintenance, and management of equipment and tools.

Goal 3: Demonstrate an understanding of the **principles of flight** as they apply to aircraft maintenance technologies.

GLO 3.1: Demonstrate an understanding of **aerodynamics, control, and stability** in fixed- and rotary-wing aircraft.

SLO 10.3.1.1	Describe properties of the atmosphere. (AME 8.G9.1)
SLO 10.3.1.2	Explain how lift is generated and affected. (AME 8.G9.2)
SLO 10.3.1.3	Explain how control and stability are achieved for aircraft in flight. (AME 8.G9.3)
SLO 10.3.1.4	Describe aircraft structures and construction. (AME 8.A11.1)
SLO 10.3.1.5	Explain aerodynamic terminology of rotary-wing aircraft. (AME 9.G10.1)
SLO 10.3.1.6	Describe forces acting on various helicopter rotor systems. (AME 9.G10.3)
SLO 10.3.1.7	Describe rotary-wing flight control systems. (AME 9.G10.5)

GLO 3.2: Demonstrate an understanding of **weight and balance.**

SLO 10.3.2.1	Define terminology used in weight and balance procedures and reports. (AME 19.G17.1)
SLO 10.3.2.2	Explain reasons for weight and balance of aircraft. (AME 19.G17.3)

SLO 10.3.2.3	Weigh aircraft and compute centre of gravity location. (AME 19.G17.4)
SLO 10.3.2.4	Prepare weight and balance report with equipment list. (AME 19.G17.5)
SLO 10.3.2.5	Amend weight and balance report and equipment list. (AME 19.G17.6)

Goal 4: Demonstrate an understanding of the major components of aircraft **propulsion systems** and their functions.

GLO 4.1: Demonstrate an understanding of **propellers.**

SLO 10.4.1.1	Identify the function of propellers.

GLO 4.2: Demonstrate an understanding of **reciprocating engines.**

SLO 10.4.2.1	Identify aircraft engine types.

GLO 4.3: Demonstrate an understanding of **turbine engines.**

No applicable SLOs.

Goal 5: Demonstrate an understanding of **aircraft ground handling**.

GLO 5.1: Demonstrate an understanding of **aircraft ground handling.**

No applicable SLOs.

Goal 6: Demonstrate an understanding of **aircraft structures and materials.**

GLO 6.1: Demonstrate an understanding of **aircraft structure types.**

SLO 10.6.1.1	Identify aircraft structure types.

GLO 6.2: Demonstrate an understanding of the **materials** used in aircraft.

SLO 10.6.2.1	Demonstrate the appropriate handling and management of materials used in aircraft maintenance technology.

GLO 6.3: Demonstrate the appropriate use of **fasteners** used in aircraft maintenance technology.

No applicable SLOs.

Goal 7: Demonstrate an understanding of aircraft **structural repair.**

GLO 7.1: Demonstrate an understanding of aircraft **structural repair.**

No applicable SLOs.

Goal 8: Demonstrate an understanding of **aircraft systems.**

GLO 8.1: Demonstrate an understanding of **hydraulic and pneumatic systems.**

No applicable SLOs.

GLO 8.2: Demonstrate an understanding of aircraft **fuel systems.**

No applicable SLOs.

GLO 8.3: Demonstrate an understanding of aircraft **landing gear.**

No applicable SLOs.

Goal 9: Describe and apply the transferable **cross-curricular knowledge and skills** that relate to aircraft maintenance technology.

GLO 9.1: **Read, interpret, and communicate information** relevant to aircraft maintenance technology.

SLO 10.9.1.1	Read, interpret, and communicate information relevant to aircraft maintenance technology.

GLO 9.2: Demonstrate competence in the use of **mathematics** required for aircraft maintenance technology.

SLO 10.9.2.1	Identify the use of different numbering systems and perform calculations. (AME 2.12.1)
SLO 10.9.2.2	Identify the use of fractions in aviation and perform calculations. (AME 2.12.2)
SLO 10.9.2.3	Convert between imperial and metric systems of measurement.

GLO 9.3: Demonstrate competence in the use of the **physics** required in aircraft maintenance technology.

SLO 10.9.3.1	Identify the use of physics in aircraft maintenance technology.

GLO 9.4: Apply **drafting** knowledge and skills.

No applicable SLOs.

Goal 10: Demonstrate awareness of **sustainability** as it pertains to aerospace technology.

GLO 10.1: Describe the impact of aerospace technology on the **health and well-being** of aerospace technologists and those who use their products.

SLO 10.10.1.1	Demonstrate an understanding of sustainability as it relates to human health and well-being.

GLO 10.2: Describe the aerospace technology industry's **sustainability practices** and **impact on the environment.**

SLO 10.10.2.1	Discuss positive and negative impacts of aircraft on the environment.
SLO 10.10.2.2	Discuss repairing and reusing parts.

GLO 10.3: Describe **sustainable business practices** within the aerospace industry.

SLO 10.10.3.1	Discuss the need for businesses to operate in a sustainable manner in order to provide services and employment.
SLO 10.10.3.2	Discuss quality assurance and its relationship to business sustainability.

Goal 11: Demonstrate awareness of the **ethical and legal standards** pertaining to aerospace technology.

GLO 11.1: Practise the **ethical and legal standards** pertaining to aerospace technology.

SLO 10.11.1.1	Demonstrate awareness of the Canadian Aviation Regulations (CARS).

Goal 12: Demonstrate **employability skills.**

GLO 12.1: Demonstrate fundamental **employability skills.**

SLO 10.12.1.1	Demonstrate the skills required to work as part of a team.
SLO 10.12.1.2	Demonstrate problem-solving skills.
SLO 10.12.1.3	Communicate clearly and respectfully.

SLO 10.12.1.4 Demonstrate regular attendance and punctuality.

SLO 10.12.1.5 Take responsibility for own actions.

SLO 10.12.1.6 Follow directions.

SLO 10.12.1.7 Stay on task.

SLO 10.12.1.8 Dress appropriately for the workplace.

GLO 12.2: Demonstrate an understanding of the **business operation** of aircraft maintenance organizations.

SLO 10.12.2.1 Demonstrate an awareness of the responsibilities assigned to various positions within the facility or organization.

Goal 13: Understand the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

GLO 13.1: Describe the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

SLO 10.13.1.1 Describe the evolution of the aircraft maintenance industry, including its technological progression and emerging trends.

SLO 10.13.1.2 Demonstrate an understanding of the history of the evolution of aircraft.

Goal 14: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

GLO 14.1: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

SLO 10.14.1.1 Describe training, education, and career opportunities in aircraft maintenance technology and related fields.

8528
AIRCRAFT ENGINES (11A)

30S/30E/30M

An Aircraft Maintenance Technology Course

8528: Aircraft Engines (11A) 30S/30E/30M

Course Description

Aircraft Engines is intended for students considering specialization in aircraft maintenance technology. Curriculum content focuses on turbine and reciprocating engines, including hands-on activities with engines. Topics include engine components and theory of operation.

For instructional purposes, the sequence of learning outcomes can vary based on the learning activities within the course. Teachers are advised to select the learning activities best suited to teach the learning outcomes, based on a variety of factors, such as access to resources or regional needs.

The curriculum is not sequential. In other words, learning outcomes might be taught in an order different from how they appear in this document.

In light of rapid changes in technology, teachers are encouraged to update learning activities in order to meet the needs of students.

Please note that some aircraft maintenance technology courses do not address all of these goals.

Goal 1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

GLO 1.1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

SLO 11A.1.1.1	Describe and apply appropriate health and safety practices for aircraft power plants.

GLO 1.2: Demonstrate knowledge of the *Trade Safety Awareness Manual*.

No applicable SLOs.

Goal 2: Demonstrate the safe and appropriate **use and maintenance of equipment and tools.**

GLO 2.1: Demonstrate the safe and appropriate **use of equipment and tools.**

SLO 11A.2.1.1	Demonstrate the safe and appropriate use of equipment and tools used in aircraft power plants.

GLO 2.2: Demonstrate the safe and appropriate **cleaning, maintenance, and management of equipment and tools.**

SLO 11A.2.2.1 Demonstrate the safe and appropriate cleaning, maintenance, and management of equipment and tools used in aircraft power plants.

Goal 3: Demonstrate an understanding of the **principles of flight** as they apply to aircraft maintenance technologies.

GLO 3.1: Demonstrate an understanding of **aerodynamics, control, and stability** in fixed- and rotary-wing aircraft.

SLO 11A.3.1.1 Demonstrate an understanding of the principles of flight as they apply to aircraft engines.

GLO 3.2: Demonstrate an understanding of **weight and balance.**

SLO 11A.3.2.1 Demonstrate an understanding of weight and balance as they apply to aircraft engines.

Goal 4: Demonstrate an understanding of the major components of aircraft **propulsion systems** and their functions.

GLO 4.1: Demonstrate an understanding of **propellers.**

SLO 11A.4.1.1 Describe applications of propellers. (AME 12.P11.1)

SLO 11A.4.1.2 Identify parts of fixed- and variable-pitch propellers. (AME 12.P11.2)

SLO 11A.4.1.3 Explain variables that affect propeller operation. (AME 12.P11.3)

SLO 11A.4.1.4 Describe general classifications and types of propellers. (AME 12.P11.4)

SLO 11A.4.1.5 Describe construction, assembly, and advantages of both wood and metal fixed-pitch propellers and ground-adjustable propellers. (AME 12.P11.5)

SLO 11A.4.1.6 Describe propeller governors. (AME 12.P11.6)

GLO 4.2: Demonstrate an understanding of **reciprocating engines.**

SLO 11A.4.2.1 Describe the history and development of aircraft reciprocating engines. (AME 11.P1.1)

SLO 11A.4.2.2 Describe engine components and accessories and their function. (AME 11.P1.2)

SLO 11A.4.2.3 Identify types of reciprocating engines and describe their characteristics. (AME 11P.1.3)

SLO 11A.4.2.4 Explain engine theory and performance. (AME 11.P1.4)

SLO 11A.4.2.5 Explain the operation of reciprocating engines. (AME 11.P1.5)

GLO 4.3: Demonstrate an understanding of **turbine engines.**

SLO 11A.4.3.1 Describe different types of gas turbine engines, including their advantages and disadvantages. (AME 23.P7.2)

SLO 11A.4.3.2 Explain physics related to gas turbine theory. (AME 23.P7.3)

SLO 11A.4.3.3 Describe gas turbine/jet engine propulsion principles. (AME 23.P7.4)

SLO 11A.4.3.4 Describe design, construction, and function of engine inlets. (AME 23.P7.5)

SLO 11A.4.3.5 Describe design and construction of compressors. (AME 23.P7.6)

SLO 11A.4.3.6 Explain design, construction, and operation of combustion chambers. (AME 23.P7.7)

SLO 11A.4.3.7 Describe design, construction, and function of turbines. (AME 23.P7.8)

SLO 11A.4.3.8 Describe design and construction of gas turbine engine exhaust systems. (AME 23.P7.9)

SLO 11A.4.3.9 Describe turbine engine internal air systems. (AME 23.P7.10)

Goal 5: Demonstrate an understanding of **aircraft ground handling**.

GLO 5.1: Demonstrate an understanding of **aircraft ground handling.**

No applicable SLOs.

Goal 6: Demonstrate an understanding of **aircraft structures and materials.**

GLO 6.1: Demonstrate an understanding of **aircraft structure types.**

SLO 11A.6.1.1 Demonstrate an understanding of aircraft structure types as they apply to aircraft engines.

GLO 6.2: Demonstrate an understanding of the **materials** used in aircraft.

SLO 11A.6.2.1 Demonstrate the appropriate handling and management of materials used in aircraft power plants.

GLO 6.3: Demonstrate the appropriate use of **fasteners** used in aircraft maintenance technology.

No applicable SLOs.

Goal 7: Demonstrate an understanding of aircraft **structural repair.**

GLO 7.1: Demonstrate an understanding of aircraft **structural repair.**

No applicable SLOs.

Goal 8: Demonstrate an understanding of **aircraft systems.**

GLO 8.1: Demonstrate an understanding of **hydraulic and pneumatic systems.**

No applicable SLOs.

GLO 8.2: Demonstrate an understanding of aircraft **fuel systems.**

No applicable SLOs.

GLO 8.3: Demonstrate an understanding of aircraft **landing gear.**

No applicable SLOs.

Goal 9: Describe and apply the transferable **cross-curricular knowledge and skills** that relate to aircraft maintenance technology.

GLO 9.1: **Read, interpret, and communicate information** relevant to aircraft maintenance technology.

SLO 11A.9.1.1 Demonstrate an understanding of documents used in power plants.

GLO 9.2: Demonstrate competence in the use of **mathematics** required for aircraft maintenance technology.

SLO 11A.9.2.1 Demonstrate competence in the mathematics required for aircraft engines.

GLO 9.3: Demonstrate competence in the use of the **physics** required in aircraft maintenance technology.

SLO 11A.9.3.1 Identify the use of physics in aircraft engines.

GLO 9.4: Apply **drafting** knowledge and skills.

No applicable SLOs.

Goal 10: Demonstrate awareness of **sustainability** as it pertains to aerospace technology.

GLO 10.1: Describe the impact of aerospace technology on the **health and well-being** of aerospace technologists and those who use their products.

SLO 11A.10.1.1 Explain the relationship between human factors and aircraft maintenance. (AME 15.G4.1)

GLO 10.2: Describe the aerospace technology industry's **sustainability practices** and **impact on the environment.**

SLO 11A.10.2.1 Discuss the impact of aircraft power plants on the environment.

SLO 11A.10.2.2 Discuss the need to reduce the spillage of fluids.

GLO 10.3: Describe **sustainable business practices** within the aerospace industry.

SLO 11A.10.3.1 Discuss the importance of reducing waste.

Goal 11: Demonstrate awareness of the **ethical and legal standards** pertaining to aerospace technology.

GLO 11.1: Practise the **ethical and legal standards** pertaining to aerospace technology.

SLO 11A.11.1.1 Discuss the implications of being a licensed aircraft maintenance engineer.

Goal 12: Demonstrate **employability skills.**

GLO 12.1: Demonstrate fundamental **employability skills.**

SLO 11A.12.1.1 Demonstrate the skills required to work as part of a team.

SLO 11A.12.1.2 Demonstrate problem-solving skills.

SLO 11A.12.1.3 Communicate clearly and respectfully.

SLO 11A.12.1.4 Demonstrate regular attendance and punctuality.

SLO 11A.12.1.5 Take responsibility for own actions.

SLO 11A.12.1.6 Follow directions.

SLO 11A.12.1.7 Stay on task.

SLO 11A.12.1.8 Dress appropriately for the workplace.

GLO 12.2: Demonstrate an understanding of the **business operation** of aircraft maintenance organizations.

No applicable SLOs.

Goal 13: Understand the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

GLO 13.1: Describe the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

SLO 11A.13.1.1 Describe the evolution of aircraft power plants, including their technological progression and emerging trends.

SLO 11A.13.1.2 Describe gas turbine engine history and development. (AME 23.P7.1)

Goal 14: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

GLO 14.1: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

SLO 11A.14.1.1 Describe training, education, and career opportunities in aircraft power plants.

8529
AIRCRAFT GROUND HANDLING (11B)

30S/30E/30M

An Aircraft Maintenance Technology Course

8529: Aircraft Ground Handling (11B) 30S/30E/30M

Course Description

Aircraft Ground Handling is intended for students continuing in the specialization phase of aircraft maintenance technology. Curriculum content focuses on an introduction to aircraft ground handling, and the mathematics and physics relevant to aircraft maintenance technology. Topics include safely performing ground handling and servicing of aircraft, and selecting and using appropriate fire extinguishers for fire suppression.

For instructional purposes, the sequence of learning outcomes can vary based on the learning activities within the course. Teachers are advised to select the learning activities best suited to teach the learning outcomes, based on a variety of factors, such as access to resources or regional needs.

The curriculum is not sequential. In other words, learning outcomes might be taught in an order different from how they appear in this document.

In light of rapid changes in technology, teachers are encouraged to update learning activities in order to meet the needs of students.

Please note that some aircraft maintenance technology courses do not address all of these goals.

Goal 1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

GLO 1.1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

SLO 11B.1.1.1	Describe and apply appropriate health and safety practices for aircraft ground handling.
SLO 11B.1.1.2	Explain causes, prevention, and extinguishing of fires.
SLO 11B.1.1.3	Describe fire-extinguishing agents and extinguishers. (AME 1.A2.2)
SLO 11B.1.1.4	Explain WHMIS. (AME 1.G15.1)
SLO 11B.1.1.5	Explain WHMIS labelling, and design workplace labels. (AME 1.G15.2)
SLO 11B.1.1.6	Access information and Material Safety Data Sheets (MSDS). (AME 1.G15.3)
SLO 11B.1.1.7	Describe WHMIS implementation and training. (AME 1.G15.4)

SLO 11B.1.1.8	Explain implementation of WHMIS in workplace (school setting). (AME 1.G15.5)
SLO 11B.1.1.9	Demonstrate housekeeping and safe work procedures. (AME 1.G18.1)

GLO 1.2: Demonstrate knowledge of the *Trade Safety Awareness Manual*.

No applicable SLOs.

Goal 2: Demonstrate the safe and appropriate **use and maintenance of equipment and tools.**

GLO 2.1: Demonstrate the safe and appropriate **use of equipment and tools.**

SLO 11B.2.1.1	Demonstrate the safe and appropriate use of equipment and tools used in aircraft ground handling.

GLO 2.2: Demonstrate the safe and appropriate **cleaning, maintenance, and management of equipment and tools.**

SLO 11B.2.2.1	Demonstrate the safe and appropriate cleaning, maintenance, and management of equipment and tools used in aircraft ground handling.

Goal 3: Demonstrate an understanding of the **principles of flight** as they apply to aircraft maintenance technologies.

GLO 3.1: Demonstrate an understanding of **aerodynamics, control, and stability** in fixed- and rotary-wing aircraft.

SLO 11B.3.1.1	Demonstrate an understanding of the principles of flight as they apply to aircraft ground handling.

GLO 3.2: Demonstrate an understanding of **weight and balance.**

SLO 11B.3.2.1	Demonstrate an understanding of weight and balance as they apply to aircraft ground handling.

Goal 4: Demonstrate an understanding of the major components of aircraft **propulsion systems** and their functions.

GLO 4.1: Demonstrate an understanding of **propellers.**

SLO 11B.4.1.1	Demonstrate an understanding of propellers as they apply to aircraft ground handling.

GLO 4.2: Demonstrate an understanding of **reciprocating engines.**

No applicable SLOs.

GLO 4.3: Demonstrate an understanding of **turbine engines.**

No applicable SLOs.

Goal 5: Demonstrate an understanding of **aircraft ground handling.**

GLO 5.1: Demonstrate an understanding of **aircraft ground handling.**

SLO 11B.5.1.1	Explain aircraft grooming procedures and precautions.
SLO 11B.5.1.2	Demonstrate ground handling, towing, and marshalling techniques. (AME 1.G18.2)
SLO 11B.5.1.3	Explain hoisting, jacking, and tying down procedures. (AME 1.G18.3)

Goal 6: Demonstrate an understanding of **aircraft structures and materials.**

GLO 6.1: Demonstrate an understanding of **aircraft structure types.**

SLO 11B.6.1.1	Demonstrate an understanding of aircraft structure types as they apply to aircraft ground handling.

GLO 6.2: Demonstrate an understanding of the **materials** used in aircraft.

SLO 11B.6.2.1	Demonstrate the appropriate handling and management of materials used in aircraft ground handling.

GLO 6.3: Demonstrate the appropriate use of **fasteners** used in aircraft maintenance technology.

No applicable SLOs.

Goal 7: Demonstrate an understanding of aircraft **structural repair.**

GLO 7.1: Demonstrate an understanding of aircraft **structural repair.**

No applicable SLOs.

Goal 8: Demonstrate an understanding of **aircraft systems.**

GLO 8.1: Demonstrate an understanding of **hydraulic and pneumatic systems.**

No applicable SLOs.

GLO 8.2: Demonstrate an understanding of aircraft **fuel systems.**

No applicable SLOs.

GLO 8.3: Demonstrate an understanding of aircraft **landing gear.**

No applicable SLOs.

Goal 9: Describe and apply the transferable **cross-curricular knowledge and skills** that relate to aircraft maintenance technology.

GLO 9.1: **Read, interpret, and communicate information** relevant to aircraft maintenance technology.

SLO 11B.9.1.1	Demonstrate an understanding of documents used in aircraft ground handling.

GLO 9.2: Demonstrate competence in the use of **mathematics** required for aircraft maintenance technology.

SLO 11B.9.2.1	Identify the use of percentages and perform calculations. (AME 2.12.3)
SLO 11B.9.2.2	Identify the use of ratios and proportions in aircraft maintenance and perform calculations. (AME 2.12.4)
SLO 11B.9.2.3	Identify the use of area and volume calculations in aircraft maintenance and perform calculations. (AME 2.12.5)
SLO 11B.9.2.4	Identify different measuring systems and perform conversions. (AME 2.12.6)
SLO 11B.9.2.5	Identify the use of angular measurement and trigonometric functions, and perform calculations. (AME 2.12.7)

GLO 9.3: Demonstrate competence in the use of the **physics** required in aircraft maintenance technology.

SLO 11B.9.3.1	Identify the different physical states of matter. (AME 2.12.8)
SLO 11B.9.3.2	Identify the basic types of energy. (AME 2.12.9)

SLO 11B.9.3.3	Identify the advantages in using simple machines in aviation maintenance, and perform calculations. (AME 2.12.10)
SLO 11B.9.3.4	Identify the different stresses, and explain strain. (AME 2.12.11)
SLO 11B.9.3.5	Identify the forces involved in motion. (AME 2.12.12)
SLO 11B.9.3.6	Identify the different factors that affect heat and pressure. (AME 2.12.13)
SLO 11B.9.3.7	Identify the laws affecting gas and fluids. (AME 2.12.14)
SLO 11B.9.3.8	Identify what affects sound and how it affects aircraft. (AME 2.12.15)

GLO 9.4: Apply **drafting** knowledge and skills.

No applicable SLOs.

Goal 10: Demonstrate awareness of **sustainability** as it pertains to aerospace technology.

GLO 10.1: Describe the impact of aerospace technology on the **health and well-being** of aerospace technologists and those who use their products.

SLO 11B.10.1.1	Identify physical and physiological factors that affect the likelihood of aircraft maintenance errors. (AME 15.G4.2)

GLO 10.2: Describe the aerospace technology industry's **sustainability practices** and **impact on the environment.**

SLO 11B.10.2.1	Discuss the proper disposal of hazardous materials.

GLO 10.3: Describe **sustainable business practices** within the aerospace industry.

SLO 11B.10.3.1	Demonstrate an awareness of the costs associated with maintaining aircraft.
SLO 11B.10.3.2	Demonstrate an awareness of the costs associated with aircraft downtime (AOG).

Goal 11: Demonstrate awareness of the **ethical and legal standards** pertaining to aerospace technology.

GLO 11.1: Practise the **ethical and legal standards** pertaining to aerospace technology.

SLO 11B.11.1.1	Discuss the legal and ethical consequences of substandard maintenance.

Goal 12: Demonstrate **employability skills.**

GLO 12.1: Demonstrate fundamental **employability skills.**

SLO 11B.12.1.1	Demonstrate the skills required to work as part of a team.
SLO 11B.12.1.2	Demonstrate problem-solving skills.
SLO 11B.12.1.3	Communicate clearly and respectfully.
SLO 11B.12.1.4	Demonstrate regular attendance and punctuality.
SLO 11B.12.1.5	Take responsibility for own actions.
SLO 11B.12.1.6	Follow directions.
SLO 11B.12.1.7	Stay on task.
SLO 11B.12.1.8	Dress appropriately for the workplace.

GLO 12.2: Demonstrate an understanding of the **business operation** of aircraft maintenance organizations.

No applicable SLOs.

Goal 13: Understand the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

GLO 13.1: Describe the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

SLO 11B.13.1.1	Describe the evolution of aircraft ground handling, including its technological progression and emerging trends.

Goal 14: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

GLO 14.1: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

SLO 11B.14.1.1	Describe training, education, and career opportunities related to aircraft ground handling.

8530
Aircraft Drawings and Documents (11C)

30S/30E/30M

An Aircraft Maintenance Technology Course

8530: Aircraft Drawings and Documents (11C) 30S/30E/30M

Course Description

Aircraft Drawings and Documents is intended for students completing the specialization phase of aircraft maintenance technology. Curriculum content focuses on an introduction to the drawings and documents used in aircraft maintenance. Topics include reading and interpreting common types of aircraft technical drawings encountered in day-to-day aircraft maintenance and repair, and creating sketches and/or drawings that accurately transmit technical information, as well as reading and interpreting documents.

For instructional purposes, the sequence of learning outcomes can vary based on the learning activities within the course. Teachers are advised to select the learning activities best suited to teach the learning outcomes, based on a variety of factors, such as access to resources or regional needs.

The curriculum is not sequential. In other words, learning outcomes might be taught in an order different from how they appear in this document.

In light of rapid changes in technology, teachers are encouraged to update learning activities in order to meet the needs of students.

Please note that some aircraft maintenance technology courses do not address all of these goals.

Goal 1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

GLO 1.1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

No applicable SLOs.

GLO 1.2: Demonstrate knowledge of the *Trade Safety Awareness Manual*.

No applicable SLOs.

Goal 2: Demonstrate the safe and appropriate **use and maintenance of equipment and tools.**

GLO 2.1: Demonstrate the safe and appropriate **use of equipment and tools**.

No applicable SLOs.

GLO 2.2: Demonstrate the safe and appropriate **cleaning, maintenance, and management of equipment and tools.**

SLO 11C.2.2.1 Demonstrate the appropriate management of aircraft drawings and documents.

Goal 3: Demonstrate an understanding of the **principles of flight** as they apply to aircraft maintenance technologies.

GLO 3.1: Demonstrate an understanding of **aerodynamics, control, and stability** in fixed- and rotary-wing aircraft.

No applicable SLOs.

GLO 3.2: Demonstrate an understanding of **weight and balance.**

No applicable SLOs.

Goal 4: Demonstrate an understanding of the major components of aircraft **propulsion systems** and their functions.

GLO 4.1: Demonstrate an understanding of **propellers.**

No applicable SLOs.

GLO 4.2: Demonstrate an understanding of **reciprocating engines.**

No applicable SLOs.

GLO 4.3: Demonstrate an understanding of **turbine engines.**

No applicable SLOs.

Goal 5: Demonstrate an understanding of **aircraft ground handling**.

GLO 5.1: Demonstrate an understanding of **aircraft ground handling.**

No applicable SLOs.

Goal 6: Demonstrate an understanding of **aircraft structures and materials.**

GLO 6.1: Demonstrate an understanding of **aircraft structure types.**

No applicable SLOs.

GLO 6.2: Demonstrate an understanding of the **materials** used in aircraft.

No applicable SLOs.

GLO 6.3: Demonstrate the appropriate use of **fasteners** used in aircraft maintenance technology.

No applicable SLOs.

Goal 7: Demonstrate an understanding of aircraft **structural repair.**

GLO 7.1: Demonstrate an understanding of aircraft **structural repair.**

No applicable SLOs.

Goal 8: Demonstrate an understanding of **aircraft systems.**

GLO 8.1: Demonstrate an understanding of **hydraulic and pneumatic systems.**

No applicable SLOs.

GLO 8.2: Demonstrate an understanding of aircraft **fuel systems.**

No applicable SLOs.

GLO 8.3: Demonstrate an understanding of aircraft **landing gear.**

No applicable SLOs.

Goal 9: Describe and apply the transferable **cross-curricular knowledge and skills** that relate to aircraft maintenance technology.

GLO 9.1: **Read, interpret, and communicate information** relevant to aircraft maintenance technology.

SLO 11C.9.1.1 Demonstrate an understanding of documents used in aircraft maintenance.

GLO 9.2: Demonstrate competence in the use of **mathematics** required for aircraft maintenance technology.

SLO 11C.2.2.1 Demonstrate competence in the mathematics required for aircraft drawings and documents.

GLO 9.3: Demonstrate competence in the use of the **physics** required in aircraft maintenance technology.

No applicable SLOs.

GLO 9.4: Apply **drafting** knowledge and skills.

SLO 11C.9.4.1	Identify drawings. (AME 20.G5.1)
SLO 11C.9.4.2	Create technical drawings, using accepted drafting techniques. (AME 20.G5.2)
SLO 11C.9.4.3	Interpret information presented in technical drawings. (AME 20.G5.3)

Goal 10: Demonstrate awareness of **sustainability** as it pertains to aerospace technology.

GLO 10.1: Describe the impact of aerospace technology on the **health and well-being** of aerospace technologists and those who use their products.

SLO 11C.10.1.1	Identify situations in which maintenance errors are likely to occur. (AME 15.G4.3)
SLO 11C.10.1.2	Discuss how technicians can manage human factors in order to prevent errors.

GLO 10.2: Describe the aerospace technology industry's **sustainability practices** and **impact on the environment**.

No applicable SLOs.

GLO 10.3: Describe **sustainable business practices** within the aerospace industry.

No applicable SLOs.

Goal 11: Demonstrate awareness of the **ethical and legal standards** pertaining to aerospace technology.

GLO 11.1: Practise the **ethical and legal standards** pertaining to aerospace technology.

No applicable SLOs.

Goal 12: Demonstrate **employability skills.**

GLO 12.1: Demonstrate fundamental **employability skills.**

SLO 11C.12.1.1	Demonstrate the skills required to work as part of a team.
SLO 11C.12.1.2	Demonstrate problem-solving skills.
SLO 11C.12.1.3	Communicate clearly and respectfully.
SLO 11C.12.1.4	Demonstrate regular attendance and punctuality.
SLO 11C.12.1.5	Take responsibility for own actions.
SLO 11C.12.1.6	Follow directions.
SLO 11C.12.1.7	Stay on task.
SLO 11C.12.1.8	Dress appropriately for the workplace.

GLO 12.2: Demonstrate an understanding of the **business operation** of aircraft maintenance organizations.

SLO 11C.12.2.1	Demonstrate an awareness of the maintenance policy manual and the maintenance procedures manual.

Goal 13: Understand the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

GLO 13.1: Describe the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

SLO 11C.13.1.1	Describe the evolution of aircraft drawings and documents, including technological progression and emerging trends.

Goal 14: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

GLO 14.1: Describe **training**, **education and career opportunities** in aircraft maintenance technology and related fields.

SLO 11C.14.1.1	Describe training, education, and career opportunities related to aircraft drawings and documents.

8531
Aircraft Structures and Materials (12A)

40S/40E/40M

An Aircraft Maintenance Technology Course

8531: Aircraft Structures and Materials (12A) 40S/40E/40M

Course Description

Aircraft Structures and Materials is intended for students entering the transition phase of aircraft maintenance technology. Curriculum content focuses on a description of metallic and non-metallic structures. Topics include types of aircraft structures, including materials.

For instructional purposes, the sequence of learning outcomes can vary based on the learning activities within the course. Teachers are advised to select the learning activities best suited to teach the learning outcomes, based on a variety of factors, such as access to resources or regional needs.

The curriculum is not sequential. In other words, learning outcomes might be taught in an order different from how they appear in this document.

In light of rapid changes in technology, teachers are encouraged to update learning activities in order to meet the needs of students.

Please note that some aircraft maintenance technology courses do not address all of these goals.

Goal 1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

GLO 1.1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

SLO 12A.1.1.1	Demonstrate an understanding of health and safety practices as they apply to structures and materials.

GLO 1.2: Demonstrate knowledge of the *Trade Safety Awareness Manual*.

No applicable SLOs.

Goal 2: Demonstrate the safe and appropriate **use and maintenance of equipment and tools.**

GLO 2.1: Demonstrate the safe and appropriate **use of equipment and tools.**

SLO 12A.2.1.1	Demonstrate the safe and appropriate use of equipment and tools associated with aircraft structures and materials.

GLO 2.2: Demonstrate the safe and appropriate **cleaning, maintenance, and management of equipment and tools.**

SLO 12A.2.2.1 Demonstrate the safe and appropriate cleaning, maintenance, and management of equipment and tools associated with aircraft structures and materials.

Goal 3: Demonstrate an understanding of the **principles of flight** as they apply to aircraft maintenance technologies.

GLO 3.1: Demonstrate an understanding of **aerodynamics, control, and stability** in fixed- and rotary-wing aircraft.

No applicable SLOs.

GLO 3.2: Demonstrate an understanding of **weight and balance.**

No applicable SLOs.

Goal 4: Demonstrate an understanding of the major components of aircraft **propulsion systems** and their functions.

GLO 4.1: Demonstrate an understanding of **propellers.**

No applicable SLOs.

GLO 4.2: Demonstrate an understanding of **reciprocating engines.**

No applicable SLOs.

GLO 4.3: Demonstrate an understanding of **turbine engines.**

No applicable SLOs.

Goal 5: Demonstrate an understanding of **aircraft ground handling**.

GLO 5.1: Demonstrate an understanding of **aircraft ground handling.**

No applicable SLOs.

Goal 6: Demonstrate an understanding of **aircraft structures and materials.**

GLO 6.1: Demonstrate an understanding of **aircraft structure types.**

SLO 12A.6.1.1 Describe types of aircraft construction.

GLO 6.2: Demonstrate an understanding of the **materials** used in aircraft.

SLO 12A.6.2.1	Inspect and repair windows. (AME 13.A12.5)
SLO 12A.6.2.2	Describe aircraft development and materials used. (AME 13.G12.1)
SLO 12A.6.2.3	Describe physical properties of materials used in aircraft construction and repair. (AME 13.G12.2)
SLO 12A.6.2.4	Describe physical properties of ferrous metals used in aircraft construction and repair. (AME 13.G12.3)
SLO 12A.6.2.5	Describe physical properties of non-ferrous metals used in aircraft construction and repair. (AME 13.G12.4)
SLO 12A.6.2.6	Describe types of plastics and glass in aviation products and their uses and maintenance. (AME 13.G12.6)
SLO 12A.6.2.7	Explain formation of corrosion and identify types of corrosion. (AME 13.G14.1)
SLO 12A.6.2.8	Determine types of corrosion and corrosion-prone areas. (AME 13.G14.2)
SLO 12A.6.2.9	Identify correct corrosion-removal methods, and remove and control corrosion. (AME 13.G14.3)
SLO 12A.6.2.10	Demonstrate methods used to prevent corrosion and to protect aircraft structures from damage caused by corrosive elements. (AME 13.G14.4)
SLO 12A.6.2.11	Describe uses of wood in aircraft manufacturing and repair. (AME 14.G12.7)
SLO 12A.6.2.12	Describe inspection and repair procedures for wood structured aircraft. (AME 14.A12.1)
SLO 12A.6.2.13	Describe fabric coverings used on aircraft. (AME 14.G12.8)
SLO 12A.6.2.14	Describe fabric covering inspection and repair. (AME 14.A12.2)

GLO 6.3: Demonstrate the appropriate use of **fasteners** used in aircraft maintenance technology.

No applicable SLOs.

Goal 7: Demonstrate an understanding of aircraft **structural repair.**

GLO 7.1: Demonstrate an understanding of aircraft **structural repair.**

No applicable SLOs.

Goal 8: Demonstrate an understanding of **aircraft systems.**

GLO 8.1: Demonstrate an understanding of **hydraulic and pneumatic systems.**

No applicable SLOs.

GLO 8.2: Demonstrate an understanding of aircraft **fuel systems.**

No applicable SLOs.

GLO 8.3: Demonstrate an understanding of aircraft **landing gear.**

No applicable SLOs.

Goal 9: Describe and apply the transferable **cross-curricular knowledge and skills** as they relate to aircraft maintenance technology.

GLO 9.1: **Read, interpret, and communicate information** relevant to aircraft maintenance technology.

SLO 12A.9.1.1 Read, interpret, and communicate information relevant to aircraft structures and materials.

GLO 9.2: Demonstrate competence in the use of **mathematics** required for aircraft maintenance technology.

SLO 12A.9.2.1 Demonstrate competence in the mathematics required for aircraft structures and materials.

GLO 9.3: Demonstrate competence in the use of the **physics** required in aircraft maintenance technology.

SLO 12A.9.3.1 Demonstrate competence in the use of the physics required in aircraft structures and materials.

GLO 9.4: Apply **drafting** knowledge and skills.

No applicable SLOs.

Goal 10: Demonstrate awareness of **sustainability** as it pertains to aerospace technology.

GLO 10.1: Describe the impact of aerospace technology on the **health and well-being** of aerospace technologists and those who use their products.

SLO 12A.10.1.1 Discuss the long-term health concerns associated with working in aircraft maintenance technology.

GLO 10.2: Describe the aerospace technology industry's **sustainability practices** and **impact on the environment**.

SLO 12A.10.2.1 Describe the aerospace technology industry's sustainability practices and impact on the environment.

GLO 10.3: Describe **sustainable business practices** within the aerospace industry.

SLO 12A.10.3.1 Describe sustainable business practices within the aerospace industry.

Goal 11: Demonstrate awareness of the **ethical and legal standards** pertaining to aerospace technology.

GLO 11.1: Practise the **ethical and legal standards** pertaining to aerospace technology.

SLO 12A.11.1.1 Demonstrate an understanding of the ethical and legal standards pertaining to the aerospace industry.

Goal 12: Demonstrate **employability skills.**

GLO 12.1: Demonstrate fundamental **employability skills.**

SLO 12A.12.1.1 Demonstrate the skills required to work as part of a team.

SLO 12A.12.1.2 Demonstrate problem-solving skills.

SLO 12A.12.1.3 Communicate clearly and respectfully.

SLO 12A.12.1.4 Demonstrate regular attendance and punctuality.

SLO 12A.12.1.5 Take responsibility for own actions.

SLO 12A.12.1.6 Follow directions.

SLO 12A.12.1.7 Stay on task.

SLO 12A.12.1.8 Dress appropriately for the workplace.

GLO 12.2: Demonstrate an understanding of the **business operation** of aircraft maintenance organizations.

SLO 12A.12.2.1 Demonstrate an understanding of the business operation of aircraft maintenance organizations.

Goal 13: Understand the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

GLO 13.1: Describe the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends.**

SLO 12A.13.1.1 Describe the evolution of aircraft structures and materials, including their technological progression and emerging trends.

Goal 14: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

GLO 14.1: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

SLO 12A.14.1.1 Describe training, education, and career opportunities related to aircraft structures and materials.

8532
AIRCRAFT HARDWARE (12B)

40S/40E/40M

An Aircraft Maintenance Technology Course

8532: Aircraft Hardware (12B)
40S/40E/40M

Course Description

Aircraft Hardware is intended for students in the transition phase of aircraft maintenance technology. Curriculum content focuses on an introduction to threaded and non-threaded fasteners and plumbing. Topics include the selection and installation of aircraft hardware and ensuring that installed hardware is certified and traceable.

For instructional purposes, the sequence of learning outcomes can vary based on the learning activities within the course. Teachers are advised to select the learning activities best suited to teach the learning outcomes, based on a variety of factors, such as access to resources or regional needs.

The curriculum is not sequential. In other words, learning outcomes might be taught in an order different from how they appear in this document.

In light of rapid changes in technology, teachers are encouraged to update learning activities in order to meet the needs of students.

Please note that some aircraft maintenance technology courses do not address all of these goals.

Goal 1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

GLO 1.1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

No applicable SLOs.

GLO 1.2: Demonstrate knowledge of the *Trade Safety Awareness Manual*.

No applicable SLOs.

Goal 2: Demonstrate the safe and appropriate **use and maintenance of equipment and tools.**

GLO 2.1: Demonstrate the safe and appropriate **use of equipment and tools.**

SLO 12B.2.1.1	Demonstrate the safe and appropriate use of equipment and tools associated with aircraft hardware.

GLO 2.2: Demonstrate the safe and appropriate **cleaning, maintenance, and management of equipment and tools.**

SLO 12B.2.2.1 Demonstrate the safe and appropriate cleaning, maintenance, and management of equipment and tools associated with aircraft hardware.

Goal 3: Demonstrate an understanding of the **principles of flight** as they apply to aircraft maintenance technologies.

GLO 3.1: Demonstrate an understanding of **aerodynamics, control, and stability** in fixed- and rotary-wing aircraft.

No applicable SLOs.

GLO 3.2: Demonstrate an understanding of **weight and balance.**

No applicable SLOs.

Goal 4: Demonstrate an understanding of the major components of aircraft **propulsion systems** and their functions.

GLO 4.1: Demonstrate an understanding of **propellers.**

No applicable SLOs.

GLO 4.2: Demonstrate an understanding of **reciprocating engines.**

No applicable SLOs.

GLO 4.3: Demonstrate an understanding of **turbine engines.**

No applicable SLOs.

Goal 5: Demonstrate an understanding of **aircraft ground handling**.

GLO 5.1: Demonstrate an understanding of **aircraft ground handling.**

No applicable SLOs.

Goal 6: Demonstrate an understanding of **aircraft structures and materials.**

GLO 6.1: Demonstrate an understanding of **aircraft structure types.**

No applicable SLOs.

GLO 6.2: Demonstrate an understanding of the **materials** used in aircraft.

No applicable SLOs.

GLO 6.3: Demonstrate the appropriate use of **fasteners** used in aircraft maintenance technology.

SLO 12B.6.3.1	Explain "standards" and "specifications" as used in aircraft industry. (AME 5.G7.1)
SLO 12B.6.3.2	Demonstrate use of threaded fasteners and related safety devices. (AME 5.G7.2)
SLO 12B.6.3.3	Describe non-threaded fasteners. (AME 5.G7.3)
SLO 12B.6.3.4	Install fluid lines and fittings. (AME 5.G7.4)

Goal 7: Demonstrate an understanding of aircraft **structural repair.**

GLO 7.1: Demonstrate an understanding of aircraft **structural repair.**

No applicable SLOs.

Goal 8: Demonstrate an understanding of **aircraft systems.**

GLO 8.1: Demonstrate an understanding of **hydraulic and pneumatic systems.**

No applicable SLOs.

GLO 8.2: Demonstrate an understanding of aircraft **fuel systems.**

No applicable SLOs.

GLO 8.3: Demonstrate an understanding of aircraft **landing gear.**

No applicable SLOs.

Goal 9: Describe and apply the transferable **cross-curricular knowledge and skills** that relate to aircraft maintenance technology.

GLO 9.1: **Read, interpret, and communicate information** relevant to aircraft maintenance technology.

SLO 12B.9.1.1	Read, interpret, and communicate information relevant to aircraft hardware.

GLO 9.2: Demonstrate competence in the use of **mathematics** required for aircraft maintenance technology.

SLO 12B.9.2.1 Demonstrate competence in the mathematics required for aircraft hardware.

GLO 9.3: Demonstrate competence in the use of the **physics** required in aircraft maintenance technology.

SLO 12B.9.3.1 Demonstrate competence in the use of the physics required in aircraft hardware.

GLO 9.4: Apply **drafting** knowledge and skills.

No applicable SLOs.

Goal 10: Demonstrate awareness of **sustainability** as it pertains to aerospace technology.

GLO 10.1: Describe the impact of aerospace technology on the **health and well-being** of aerospace technologists and those who use their products.

No applicable SLOs.

GLO 10.2: Describe the aerospace technology industry's **sustainability practices** and **impact on the environment**.

No applicable SLOs.

GLO 10.3: Describe **sustainable business practices** within the aerospace industry.

No applicable SLOs.

Goal 11: Demonstrate awareness of the **ethical and legal standards** pertaining to aerospace technology.

GLO 11.1: Practise the **ethical and legal standards** pertaining to aerospace technology.

SLO 12B.11.1.1 Practise ethical and legal behaviour.

Goal 12: Demonstrate **employability skills.**

GLO 12.1: Demonstrate fundamental **employability skills.**

SLO 12B.12.1.1	Demonstrate the skills required to work as part of a team.
SLO 12B.12.1.2	Demonstrate problem-solving skills.
SLO 12B.12.1.3	Communicate clearly and respectfully.
SLO 12B.12.1.4	Demonstrate regular attendance and punctuality.
SLO 12B.12.1.5	Take responsibility for own actions.
SLO 12B.12.1.6	Follow directions.
SLO 12B.12.1.7	Stay on task.
SLO 12B.12.1.8	Dress appropriately for the workplace.

GLO 12.2: Demonstrate an understanding of the **business operation** of aircraft maintenance organizations.

No applicable SLOs.

Goal 13: Understand the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

GLO 13.1: Describe the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

SLO 12B.13.1.1	Describe the evolution of aircraft hardware, including its technological progression and emerging trends.

Goal 14: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

GLO 14.1: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

SLO 12B.14.1.1	Describe training, education, and career opportunities related to aircraft hardware.

8533
Aircraft Structural Repair (12C)

40S/40E/40M

An Aircraft Maintenance Technology Course

8533: Aircraft Structural Repair (12C) 40S/40E/40M

Course Description

Aircraft Structural Repair is intended for students in the transition phase of aircraft maintenance technology. Curriculum content focuses on an introduction to repairing the structures of aircraft. Topics include the maintenance of aircraft metallic and non-metallic structures including hands-on projects.

For instructional purposes, the sequence of learning outcomes can vary based on the learning activities within the course. Teachers are advised to select the learning activities best suited to teach the learning outcomes, based on a variety of factors, such as access to resources or regional needs.

The curriculum is not sequential. In other words, learning outcomes might be taught in an order different from how they appear in this document.

In light of rapid changes in technology, teachers are encouraged to update learning activities in order to meet the needs of students.

Please note that some aircraft maintenance technology courses do not address all of these goals.

Goal 1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

GLO 1.1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

SLO 12C.1.1.1	Demonstrate an understanding of health and safety practices as they apply to structural repair.

GLO 1.2: Demonstrate knowledge of the *Trade Safety Awareness Manual*.

No applicable SLOs.

Goal 2: Demonstrate the safe and appropriate **use and maintenance of equipment and tools.**

GLO 2.1: Demonstrate the safe and appropriate **use of equipment and tools.**

SLO 12C.2.1.1	Demonstrate the safe and appropriate use of equipment and tools associated with structural repair.

GLO 2.2: Demonstrate the safe and appropriate **cleaning, maintenance, and management of equipment and tools.**

SLO 12C.2.2.1	Demonstrate the safe and appropriate cleaning, maintenance, and management of equipment and tools associated with structural repair.

Goal 3: Demonstrate an understanding of the **principles of flight** as they apply to aircraft maintenance technologies.

GLO 3.1: Demonstrate an understanding of **aerodynamics, control, and stability** in fixed- and rotary-wing aircraft.

SLO 12C.3.1.1	Describe properties of atmosphere. (AME 8.G9.1)
SLO 12C.3.1.2	Explain how lift is generated and affected. (AME 8.G9.2)
SLO 12C.3.1.3	Explain how control and stability are achieved for aircraft in flight. (AME 8.G9.3)
SLO 12C.3.1.4	Explain principles of high-speed flight, problems encountered, and how those problems have been addressed. (AME 8.G9.4)
SLO 12C.3.1.5	Describe cable and wire control systems. (AME 8.A7.2)
SLO 12C.3.1.6	Describe rod and tube control systems. (AME 8.A7.3)
SLO 12C.3.1.7	Check aircraft fixed surfaces. (AME 8.A7.7)
SLO 12C.3.1.8	Rig flying control surfaces. (AME 8.A7.8)
SLO 12C.3.1.9	Locate and identify components of aircraft or helicopter cable control systems. (AME 8.A7.2.6)
SLO 12C.3.1.10	Tension and secure aircraft control cable(s). (AME 8.A7.2.7)
SLO 12C.3.1.11	Swage steel-wire cable. (AME 8.A7.2.8)
SLO 12C.3.1.12	Locate and identify control systems of aircraft. (AME 8.A7.3.5)
SLO 12C.3.1.13	Inspect control systems.
SLO 12C.3.1.14	Install/rig flight control systems.
SLO 12C.3.1.15	Explain aerodynamic terminology of rotary-wing aircraft. (AME 9.G10.1)
SLO 12C.3.1.16	Describe various rotor designs using accepted terminology. (AME 9.G10.2)
SLO 12C.3.1.17	Describe forces acting on various helicopter rotor systems. (AME 9.G10.3)

SLO 12C.3.1.18 Describe autorotation, ground resonance, and stability with regard to helicopter types. (AME 9.G10.4)

SLO 12C.3.1.19 Describe rotary-wing flight control systems. (AME 9.G10.5)

GLO 3.2: Demonstrate an understanding of **weight and balance.**

SLO 12C.3.2.1 Define terminology used in weight and balance procedures and reports. (AME 19.G17.1)

SLO 12C.3.2.2 Explain reasons for weight and balance of aircraft. (AME 19.G17.3)

SLO 12C.3.2.3 Weigh aircraft and compute centre of gravity location. (AME 19.G17.4)

SLO 12C.3.2.4 Prepare weight and balance report with equipment list. (AME 19.G17.5)

SLO 12C.3.2.5 Amend weight and balance report and equipment list. (AME 19.G17.6)

Goal 4: Demonstrate an understanding of the major components of aircraft **propulsion systems** and their functions.

GLO 4.1: Demonstrate an understanding of **propellers.**

No applicable SLOs.

GLO 4.2: Demonstrate an understanding of **reciprocating engines.**

No applicable SLOs.

GLO 4.3: Demonstrate an understanding of **turbine engines.**

No applicable SLOs.

Goal 5: Demonstrate an understanding of **aircraft ground handling**.

GLO 5.1: Demonstrate an understanding of **aircraft ground handling.**

No applicable SLOs.

Goal 6: Demonstrate an understanding of **aircraft structures and materials.**

GLO 6.1: Demonstrate an understanding of **aircraft structure types.**

No applicable SLOs.

GLO 6.2: Demonstrate an understanding of the **materials** used in aircraft.

No applicable SLOs.

GLO 6.3: Demonstrate the appropriate use of **fasteners** used in aircraft maintenance technology.

No applicable SLOs.

Goal 7: Demonstrate an understanding of aircraft **structural repair.**

GLO 7.1: Demonstrate an understanding of aircraft **structural repair.**

SLO 12C.7.1.1	Describe sheet metal tools. (AME 21.G6.5)
SLO 12C.7.1.2	Identify and handle aircraft sheet metal, and describe related documentation. (AME 21.A11.3)
SLO 12C.7.1.3	Lay out, cut, and drill sheet metal. (AME 21.A11.4)
SLO 12C.7.1.4	Install rivets; inspect condition and installation of rivets; and remove poor or damaged rivets. (AME 21.A11.5)
SLO 12C.7.1.5	Form and bend sheet metal. (AME 21.A11.6)
SLO12C.7.1.6	Perform sheet metal repairs. (AME 21.A11.7)

Goal 8: Demonstrate an understanding of **aircraft systems.**

GLO 8.1: Demonstrate an understanding of **hydraulic and pneumatic systems.**

No applicable SLOs.

GLO 8.2: Demonstrate an understanding of aircraft **fuel systems.**

No applicable SLOs.

GLO 8.3: Demonstrate an understanding of aircraft **landing gear.**

No applicable SLOs.

Goal 9: Describe and apply the transferable **cross-curricular knowledge and skills** that relate to aircraft maintenance technology.

GLO 9.1: **Read, interpret, and communicate information** relevant to aircraft maintenance technology.

SLO 12C.9.1.1	Read, interpret, and communicate information relevant to aircraft structural repair.

GLO 9.2: Demonstrate competence in the use of **mathematics** required for aircraft maintenance technology.

SLO 12C.9.2.1 Demonstrate competence in the mathematics required for aircraft structural repair.

GLO 9.3: Demonstrate competence in the use of the **physics** required in aircraft maintenance technology.

SLO 12C.9.3.1 Demonstrate competence in the use of the physics required in aircraft structural repair.

GLO 9.4: Apply **drafting** knowledge and skills.

No applicable SLOs.

Goal 10: Demonstrate awareness of **sustainability** as it pertains to aerospace technology.

GLO 10.1: Describe the impact of aerospace technology on the **health and well-being** of aerospace technologists and those who use their products.

No applicable SLOs.

GLO 10.2: Describe the aerospace technology industry's **sustainability practices** and **impact on the environment**.

No applicable SLOs.

GLO 10.3: Describe **sustainable business practices** within the aerospace industry.

No applicable SLOs.

Goal 11: Demonstrate awareness of the **ethical and legal standards** pertaining to aerospace technology.

GLO 11.1: Practise the **ethical and legal standards** pertaining to aerospace technology.

No applicable SLOs.

Goal 12: Demonstrate **employability skills.**

GLO 12.1: Demonstrate fundamental **employability skills.**

SLO 12C.12.1.1 Demonstrate the skills required to work as part of a team.

SLO 12C.12.1.2 Demonstrate problem-solving skills.

SLO 12C.12.1.3 Communicate clearly and respectfully.

SLO 12C.12.1.4 Demonstrate regular attendance and punctuality.

SLO 12C.12.1.5 Take responsibility for own actions.

SLO 12C.12.1.6 Follow directions.

SLO 12C.12.1.7 Stay on task.

SLO 12C.12.1.8 Dress appropriately for the workplace.

GLO 12.2: Demonstrate an understanding of the **business operation** of aircraft maintenance organizations.

No applicable SLOs.

Goal 13: Understand the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

GLO 13.1: Describe the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

SLO 12C.13.1.1 Describe the evolution of aircraft structural repair, including its technological progression and emerging trends.

Goal 14: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

GLO 14.1: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

SLO 12C.14.1.1 Describe training, education, and career opportunities related to aircraft structural repair.

8534
AIRCRAFT SYSTEMS (12D)

40S/40E/40M

An Aircraft Maintenance Technology Course

8534: Aircraft Systems (12D) 40S/40E/40M

Course Description

Aircraft Systems is intended for students transitioning from Aircraft maintenance technology. Curriculum content focuses on an overview of the maintenance of the systems found in aircraft. Topics include fuel systems, landing gear, and hydraulic and pneumatic systems.

For instructional purposes, the sequence of learning outcomes can vary based on the learning activities within the course. Teachers are advised to select the learning activities best suited to teach the learning outcomes, based on a variety of factors, such as access to resources or regional needs.

The curriculum is not sequential. In other words, learning outcomes might be taught in an order different from how they appear in this document.

In light of rapid changes in technology, teachers are encouraged to update learning activities in order to meet the needs of students.

Please note that some aircraft maintenance technology courses do not address all of these goals.

Goal 1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

GLO 1.1: Describe and apply appropriate **health and safety practices** for aircraft maintenance technology.

SLO 12D.1.1.1	Demonstrate an understanding of health and safety practices as they apply to aircraft systems.

GLO 1.2: Demonstrate knowledge of the *Trade Safety Awareness Manual*.

No applicable SLOs.

Goal 2: Demonstrate the safe and appropriate **use and maintenance of equipment and tools.**

GLO 2.1: Demonstrate the safe and appropriate **use of equipment and tools.**

SLO 12D.2.1.1	Demonstrate the safe and appropriate use of equipment and tools associated with aircraft systems.

GLO 2.2: Demonstrate the safe and appropriate **cleaning, maintenance, and management of equipment and tools.**

SLO 12D.2.2.1 Demonstrate the safe and appropriate cleaning, maintenance, and management of equipment and tools associated with aircraft systems.

Goal 3: Demonstrate an understanding of the **principles of flight** as they apply to aircraft maintenance technologies.

GLO 3.1: Demonstrate an understanding of **aerodynamics, control, and stability** in fixed- and rotary-wing aircraft.

No applicable SLOs.

GLO 3.2: Demonstrate an understanding of **weight and balance.**

No applicable SLOs.

Goal 4: Demonstrate an understanding of the major components of aircraft **propulsion systems** and their functions.

GLO 4.1: Demonstrate an understanding of **propellers.**

No applicable SLOs.

GLO 4.2: Demonstrate an understanding of **reciprocating engines.**

No applicable SLOs.

GLO 4.3: Demonstrate an understanding of **turbine engines.**

No applicable SLOs.

Goal 5: Demonstrate an understanding of **aircraft ground handling.**

GLO 5.1: Demonstrate an understanding of **aircraft ground handling.**

No applicable SLOs.

Goal 6: Demonstrate an understanding of **aircraft structures and materials.**

GLO 6.1: Demonstrate an understanding of **aircraft structure types.**

No applicable SLOs.

GLO 6.2: Demonstrate an understanding of the **materials** used in aircraft.

No applicable SLOs.

GLO 6.3: Demonstrate the appropriate use of **fasteners** used in aircraft maintenance technology.

No applicable SLOs.

Goal 7: Demonstrate an understanding of aircraft **structural repair.**

GLO 7.1: Demonstrate an understanding of aircraft **structural repair.**

No applicable SLOs.

Goal 8: Demonstrate an understanding of **aircraft systems.**

GLO 8.1: Demonstrate an understanding of **hydraulic and pneumatic systems.**

SLO 12D.8.1.1	Describe the aircraft pneumatic system operation and components. (AME 6.A4.5)
SLO 12D.8.1.2	Explain the function of hydraulic components. (AME 6.A5.1)
SLO 12D.8.1.3	Describe methods of operating hydraulic systems in the event of main system failure. (AME 6.A5.2)
SLO 12D.8.1.4	Explain the operation of hydraulic sub-systems. (AME 6.A5.3)
SLO 12D.8.1.5	Describe the operation of sub-systems of independent hydraulic power systems. (AME 6.A5.4)
SLO 12D.8.1.6	Explain the purpose of all components in helicopter hydraulic systems. (AME 6.A5.5)
SLO 12D.8.1.7	Inspect aircraft hydraulic systems. (AME 6.A5.6)
SLO 12D.8.1.8	Troubleshoot hydraulic systems and recommend corrective action. (AME 6.A5.7)
SLO 12D.8.1.9	Explain and operate hydraulic control systems. (AME 6.A7.6)
SLO12D.8.1.10	Demonstrate physical laws governing behaviour of fluids in motion and under pressure. (AME 6.G13.1)
SLO 12D.8.1.11	Perform work and power calculations given certain variables. (AME 6.G13.2)
SLO 12D.8.1.12	Describe properties of hydraulic fluids. (AME 6.G13.3)

SLO 12D.8.1.13	Explain how components fit together to form a simple, closed hydraulic system. (AME 6.G13.4)
SLO 12D.8.1.14	Recognize the difference between open- and closed-centre systems. (AME 6.G13.5)
SLO 12D.8.1.15	Explain operational differences between pneumatic and hydraulic systems. (AME 6.G13.7)
SLO 12D.8.1.16	Install and test hydraulic seals, and test components. (AME 6.G13.8)

GLO 8.2: Demonstrate an understanding of aircraft **fuel systems.**

SLO 12D.8.2.1	Describe aircraft fuels. (AME 4.A3.1)
SLO 12D.8.2.2	Describe fuel systems and components. (AME 4.A3.2)
SLO 12D.8.2.3	Explain fuel system operations. (AME 4.A3.3)
SLO 12D.8.2.4	Describe and perform aircraft fuel system maintenance. (AME 4.A3.4)

GLO 8.3: Demonstrate an understanding of aircraft **landing gear.**

SLO 12D.8.3.1	Describe landing gear types and configurations, and remove/install main landing gear. (AME 7.A6.1)
SLO 12D.8.3.2	Inspect and remove/install floats and skis. (AME 7.A6.2)
SLO 12D.8.3.3	Maintain aircraft wheels. (AME 7.A6.3)
SLO 12D.8.3.4	Maintain aircraft tires and balance wheels. (AME 7.A6.4)
SLO 12D.8.3.5	Maintain aircraft brakes. (AME 7.A6.5)
SLO 12D.8.3.6	Explain anti-skid systems. (AME 7.A6.6)
SLO 12D.8.3.7	Maintain gear retraction systems. (AME 7.A6.7)

Goal 9: Describe and apply the transferable **cross-curricular knowledge and skills** that relate to aircraft maintenance technology.

GLO 9.1: **Read, interpret, and communicate information** relevant to aircraft maintenance technology.

SLO 12D.9.1.1	Read, interpret, and communicate information relevant to aircraft systems.

GLO 9.2: Demonstrate competence in the use of **mathematics** required for aircraft maintenance technology.

SLO 12D.9.2.1	Demonstrate competence in the mathematics required for aircraft systems.

GLO 9.3: Demonstrate competence in the use of the **physics** required in aircraft maintenance technology.

SLO 12D.9.3.1 Demonstrate competence in the use of the physics required in aircraft systems.

GLO 9.4: Apply **drafting** knowledge and skills.

No applicable SLOs.

Goal 10: Demonstrate awareness of **sustainability** as it pertains to aerospace technology.

GLO 10.1: Describe the impact of aerospace technology on the **health and well-being** of aerospace technologists and those who use their products.

No applicable SLOs.

GLO 10.2: Describe the aerospace technology industry's **sustainability practices** and **impact on the environment**.

No applicable SLOs.

GLO 10.3: Describe **sustainable business practices** within the aerospace industry.

No applicable SLOs.

Goal 11: Demonstrate awareness of the **ethical and legal standards** pertaining to aerospace technology.

GLO 11.1: Practise the **ethical and legal standards** pertaining to aerospace technology.

No applicable SLOs.

Goal 12: Demonstrate **employability skills.**

GLO 12.1: Demonstrate fundamental **employability skills.**

SLO 12D.12.1.1 Demonstrate the skills required to work as part of a team.

SLO 12D.12.1.2 Demonstrate problem-solving skills.

SLO 12D.12.1.3 Communicate clearly and respectfully.

SLO 12D.12.1.4 Demonstrate regular attendance and punctuality.

SLO 12D.12.1.5 Take responsibility for own actions.

SLO 12D.12.1.6 Follow directions.

SLO 12D.12.1.7 Stay on task.

SLO 12D.12.1.8 Dress appropriately for the workplace.

GLO 12.2: Demonstrate an understanding of the **business operation** of aircraft maintenance organizations.

No applicable SLOs.

Goal 13: Understand the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

GLO 13.1: Describe the **evolution** of the aircraft maintenance industry, including its **technological progression and emerging trends**.

SLO 12D.13.1.1 Describe the evolution of aircraft systems, including its technological progression and emerging trends.

Goal 14: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

GLO 14.1: Describe **training**, **education, and career opportunities** in aircraft maintenance technology and related fields.

SLO 12D.14.1.1 Describe training, education, and career opportunities related to aircraft systems.

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