



8561

AIRCRAFT SYSTEMS AND
PROPULSION (12C)

40S/40E/40M

An Aviation and Aerospace Technologies Course

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Course Description

Aircraft Systems and Propulsion is intended for students in the transition phase of aviation and aerospace technologies. Curriculum content provides an introduction to turbine engines, propellers, hydraulic, pneumatic, pitot-static, and fuel systems. Topics include the inspection and maintenance of the above systems and gas turbine theory.

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 course.

The curriculum is not sequential. For instructional purposes, the sequence of learning outcomes can vary based on the learning activities within the course.

Goal 1: Describe and apply appropriate **health and safety** practices for aerospace technologies.

GLO 1.1: Describe and apply appropriate **health and safety** practices for aerospace technologies.

SLO 12C.1.1.1 Describe and apply appropriate health and safety practices for aircraft systems and propulsion.

Goal 2: Demonstrate comprehension of the **principles of flight**, as they apply to aviation and aerospace technologies.

GLO 2.1: Demonstrate an understanding of **aerodynamics, control,** and **stability** in **fixed-** and **rotary-wing** aircraft.

SLO 12C.2.1.1 Demonstrate an understanding of control and stability as they apply to aircraft systems and propulsion.

Goal 3: Demonstrate an understanding of the **major components of an aircraft** and their **functions**.

GLO 3.1: Demonstrate an understanding of the **major components of an aircraft** and their **functions**.

SLO 12C.3.1.1 Demonstrate an understanding of the major components found in the following: hydraulic systems, pneumatic systems, pitot-static systems, fuel systems, aircraft engines, and propellers.

Goal 4: Demonstrate comprehension of aircraft systems.**GLO 4.1: Describe aircraft systems and their purposes.**

- SLO 12C.4.1.1 Describe the functions of the major components of an aircraft's hydraulic system.
- SLO 12C.4.1.2 Describe the functions of the major components of an aircraft's pneumatic system.
- SLO 12C.4.1.3 Describe the functions of the major components of an aircraft's pitot-static system.
- SLO 12C.4.1.4 Describe the functions of the major components of an aircraft's fuel system.
- SLO 12C.4.1.5 Describe different types of gas turbine engines, including their advantages and disadvantages. (AME 23.P7.2)
- SLO 12C.4.1.6 Explain the physics related to gas turbine theory. (AME 23.P7.3)
- SLO 12C.4.1.7 Describe gas turbine/jet engine propulsion principles. (AME 23.P7.4)
- SLO 12C.4.1.8 Describe the design, construction, and function of engine inlets. (AME 23.P7.5)
- SLO 12C.4.1.9 Describe the design and construction of compressors. (AME 23.P7.6)
- SLO 12C.4.1.10 Explain the design, construction, and operation of combustion chambers. (AME 23.P7.7)
- SLO 12C.4.1.11 Describe the design, construction, and function of turbines. (AME 23.P7.8)
- SLO 12C.4.1.12 Describe the design and construction of gas turbine engine exhaust systems. (AME 23.P7.9)
- SLO 12C.4.1.13 Describe the turbine engine internal air systems. (AME 23.P7.10)
- SLO 12C.4.1.14 Describe the applications of propellers. (AME 12.P11.1)
- SLO 12C.4.1.15 Identify parts of fixed and variable pitch propellers. (AME 12.P11.2)
- SLO 12C.4.1.16 Explain the variables that affect propeller operation. (AME 12.P11.3)
- SLO 12C.4.1.17 Describe the general classifications and types of propellers. (AME 12.P11.4)
- SLO 12C.4.1.18 Describe the construction, assembly, and advantages of both wood and metal fixed pitch propellers and ground-adjustable propellers. (AME 12.P11.5)
- SLO 12C.4.1.19 Describe propeller governors. (AME 12.P11.6)

Goal 5: Demonstrate the safe and appropriate **operation** of **equipment and tools**.

GLO 5.1: Describe the safe and appropriate **management** of **equipment and tools**.

No applicable SLOs.

GLO 5.2: Demonstrate the **operation** of **tools and equipment** to fabricate **metallic** parts and projects.

No applicable SLOs.

GLO 5.3: Demonstrate the **operation** of **tools and equipment** to fabricate **non-metallic** parts and projects.

No applicable SLOs.

Goal 6: Demonstrate comprehension of the properties and applications of various **materials and consumables** used in the aviation and aerospace industry.

GLO 6.1: Explain the **properties** of various **materials and consumables** used in the aviation and aerospace industry.

No applicable SLOs.

GLO 6.2: Describe **applications** of the various aerospace **materials and consumables**.

No applicable SLOs.

Goal 7: Fabricate parts and components for use in the aviation and aerospace industry.

GLO 7.1: Fabricate **metallic** parts.

No applicable SLOs.

GLO 7.2: Fabricate **non-metallic** parts.

No applicable SLOs.

GLO 7.3: Fabricate **electrical/electronic** components.

No applicable SLOs.

Goal 8: Describe and demonstrate the transferable **cross-curricular skills** as they pertain to **aviation and aerospace technologies**.

GLO 8.1: **Read, interpret, and communicate** information relevant to aviation and aerospace technologies.

SLO 12C.8.1.1 Read, interpret, and communicate information relevant to aviation and aerospace technologies.

GLO 8.2: Acquire and organize information using **information and communication technology**.

No applicable SLOs.

GLO 8.3: Apply **mathematical** knowledge and skills related to aviation and aerospace technologies.

SLO 12C.8.3.1 Demonstrate the addition, subtraction, multiplication, and division (for more than 1-digit divisors or 2-digit multipliers) of whole numbers, decimals, and fractions to solve problems.

SLO 12C.8.3.2 Demonstrate the use of fractions, decimals, ratios, and percentages.

SLO 12C.8.3.3 Convert from imperial to metric measurements.

GLO 8.4: Apply **scientific** knowledge and skills related to aviation and aerospace technologies.

No applicable SLOs.

Goal 9: Describe **career opportunities** in aviation and aerospace technologies and associated fields.

GLO 9.1: Describe **education** and **career opportunities** and **professional organizations** in aviation and aerospace technologies and associated fields.

SLO 12C.9.1.1 Demonstrate an awareness of various aircraft maintenance engineer licence categories.

Goal 10: Demonstrate an awareness of **sustainability** as it pertains to aviation and aerospace technologies.

GLO 10.1: Describe the impact of the aviation and aerospace industry on **human health and well-being**.

SLO 12C.10.1.1 Describe basic concepts of human factors (Dirty Dozen) as applied to aviation and aerospace technologies.

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

SLO 12C.10.2.1 Discuss how the use of more fuel-efficient engines in aircraft results in a reduced impact on the environment.

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

SLO 12C.10.3.1 Discuss the effects of unsustainable business practices on the viability of an aviation and aerospace facility, and the resulting impact on the community and stakeholders.

Goal 11: Demonstrate an awareness of the **ethical and legal standards** as they pertain to aviation and aerospace technologies.

GLO 11.1: Practise the **ethical and legal standards** as they pertain to aviation and aerospace technologies.

No applicable SLOs.

Goal 12: Demonstrate **employability skills** related to aviation and aerospace technologies.

GLO 12.1: Demonstrate **employability skills** related to aviation and aerospace technologies.

SLO 12C.12.1.1 Define TOWES (Test of Workplace Essential Skills), and state how it relates to employment in the aviation and aerospace industry.

SLO 12C.12.1.2 Apply the three domains of TOWES (text reading, document use, and numeracy) in learning activities.

SLO 12C.12.1.3 List and define the criteria that comprise the Global Industry Standard of essential skills for employees.

SLO 12C.12.1.4 List and define the criteria that comprise the Conference Board of Canada's *Employability Skills 2000+* for employees.

Goal 13: Describe the **evolution** of aviation and aerospace technologies, including **technological progression** and **emerging trends**.

GLO 13.1: Describe the **evolution** of aviation and aerospace technologies, including **technological progression** and **emerging trends**.

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