



8543

EXPLORATION OF
AVIATION AND AEROSPACE
TECHNOLOGIES (9)

15S/15E/15M

10S/10E/10M

An Aviation and Aerospace Technologies Course

8543: EXPLORATION OF AVIATION AND AEROSPACE TECHNOLOGIES (9) 15S/15E/15M 10S/10E/10M

Course Description

Exploration of Aviation and Aerospace Technologies is an optional half-credit or full-credit course intended for students wishing to sample aviation and aerospace technologies. Curriculum content focuses on an exploration of the maintenance and manufacturing of aircraft. The emphasis will be on project-based learning activities.

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.

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| SLO 9.1.1.1 | Demonstrate an awareness of the principles of Workplace Hazardous Materials Information Systems (WHMIS) as they apply to aerospace technologies. |
| SLO 9.1.1.2 | Describe the purpose of Material Safety Data Sheets (MSDS). |
| SLO 9.1.1.3 | Describe workplace health and safety procedures (e.g., S.A.F.E., Right to Refuse). |
| SLO 9.1.1.4 | Demonstrate the ability to follow safety information on supplier labels. |
| SLO 9.1.1.5 | Follow personal and environmental health and safety procedures. |
| SLO 9.1.1.6 | Identify immediate hazards and their impact on self, others, and the environment. |
| SLO 9.1.1.7 | Identify and follow appropriate emergency response procedures. |

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 9.2.1.1 Demonstrate an understanding of the terms relating to aerodynamics and airfoils.

SLO 9.2.1.2 Demonstrate an understanding of the four forces acting on an aircraft in straight and level flight.

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**.

No applicable SLOs.

Goal 4: Demonstrate comprehension of **aircraft systems**.

GLO 4.1: Describe **aircraft systems** and their purposes.

SLO 9.4.1.1 Identify the types of systems that are present in fixed-wing aircraft.

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**.

SLO 9.5.1.1 Identify the safe and appropriate cleaning, storage, and management of equipment and tools.

SLO 9.5.1.2 Identify the pounding, turning, cutting, holding, and measuring hand tools used in the aviation and aerospace industry.

SLO 9.5.1.3 Explain the safe operating procedures for the pounding, turning, and cutting equipment used in the aviation and aerospace industry.

SLO 9.5.1.4 Select, operate, and maintain the appropriate pounding, turning, cutting, holding, and measuring hand tools, power tools, and equipment used in the aviation and aerospace industry.

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

- SLO 9.5.2.1 Demonstrate several common metal fastening processes, such as using threaded fasteners and riveting.
 - SLO 9.5.2.2 Demonstrate several common metal forming processes.
 - SLO 9.5.2.3 Apply several mechanical forming processes to a metal product.
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GLO 5.3: Demonstrate the **operation** of **tools and equipment** to fabricate **non-metallic** parts and projects.

- SLO 9.5.3.1 Perform the kit cutting of composite materials for a solid laminate constructed project.
 - SLO 9.5.3.2 Perform a manual layup for composite plies for a solid laminate constructed project.
 - SLO 9.5.3.3 Perform a trim process using manual trimming procedures for post-cured composite materials.
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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.

- SLO 9.6.1.1 Identify common materials and their classification.
 - SLO 9.6.1.2 Demonstrate an understanding of material properties as they apply to the aviation and aerospace industry.
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GLO 6.2: Describe **applications** of the various aerospace **materials and consumables**.

- SLO 9.6.2.1 Identify which materials are used in the various aircraft structures and components.
- SLO 9.6.2.2 List the applications of composite materials in aircraft fabrication.
- SLO 9.6.2.3 Describe types of composite construction.
- SLO 9.6.2.4 State methods of processing pre-cured composite materials, including the use of hand and power tools for
 - cutting
 - drilling
 - sanding

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

GLO 7.1: Fabricate metallic parts.

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| SLO 9.7.1.1 | Identify several common measurement/layout tools used in metalworking. |
| SLO 9.7.1.2 | Describe the process for marking and drilling holes in sheet metal. |
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GLO 7.2: Fabricate non-metallic parts.

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| SLO 9.7.2.1 | Identify several common measurement/layout tools used in composite fabrication. |
| SLO 9.7.2.2 | Use several common layout tools used in composite fabrication. |
| SLO 9.7.2.3 | Describe the process for marking and drilling holes in composite material. |
| SLO 9.7.2.4 | Inspect a composite panel using the tap test and the visual method. |
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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.

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| SLO 9.8.1.1 | Interpret a graphic presentation of a technical idea. |
| SLO 9.8.1.2 | Identify and demonstrate the proper use of tools, materials, and equipment used to create technical drawings. |
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GLO 8.2: Acquire and organize information using information and communication technology.

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| SLO 9.8.2.1 | Acquire and organize information using appropriate technology and information systems. |
| SLO 9.8.2.2 | Demonstrate the appropriate use of information as directed. |
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GLO 8.3: Apply **mathematical** knowledge and skills related to aviation and aerospace technologies.

SLO 9.8.3.1 Recognize and apply common measurement standards used in metalworking.

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

SLO 9.8.4.1 Explain Bernoulli's principle as it applies to a venturi.

SLO 9.8.4.2 Describe Newton's laws of motion.

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 9.9.1.1 Demonstrate an awareness of careers in aviation and aerospace technologies and associated fields.

SLO 9.9.1.2 Describe career opportunities in aviation and aerospace technologies.

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**.

No applicable SLOs.

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

SLO 9.10.2.1 Explain how and why lightweight and recyclable materials are used in aircraft production.

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

No applicable SLOs.

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.

SLO 9.11.1.1 Discuss the meaning of ethical and legal standards.

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

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

No applicable SLOs.

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**.

No applicable SLOs.
