Composites Technology

Also see Manufacturing and Marine Maintenance Technology

Program Description

The Composites (CMPST) program at Skagit Valley College is designed to provide a comprehensive education for the next generation of composite technicians. Marine, aerospace, transportation, medicine, construction, energy, and sports equipment represent some of the industries where composites are used. The growing demand for stronger, lighter and more efficient building materials is driving the demand for skilled composites technicians who can work with these new materials and processes.

This certificate program provides students with skills and knowledge in plant safety, manufacture and repair processes, composite materials, gel coat/controlled spraying/fluid handling applications, vacuum infusion process, light resin transfer molding (RTM), part and tooling design techniques, and composites strength of materials. Students learn chemical safety, design, modern closed mold techniques, and construction of molds to construct a variety of parts. Students work toward taking American Composites Manufacturers Association (ACMA) certification exams – the standard for composites credentialing. The Composites program offers the student options for short and long-term certificates.

Composite manufacturing has evolved into a diverse industry and can be found in the marine, aerospace, automotive, sports equipment, construction, alternative energy, medical devices, and many other industries, creating an expanding wealth of opportunity for talented practitioners. The Composites program at Skagit Valley College is designed to provide a comprehensive education for the next generation of composite technicians. This certificate program provides students with skills and knowledge in plant safety, manufacturing processes, composite materials, gelcoat/controlled spraying/fluid handling applications, vacuum infusion process, light resin transfer molding (RTM), part and tooling design techniques and composites strength of materials. Students learn chemical safety, design, modern closed mold techniques, and construction of molds to construct a variety of parts.

Why enroll in the Composites Technology program at Skagit Valley College?

- The field of composites is growing.
- The Skagit Valley College program prepares students for entry into many industries using composite technology.
- Courses are developed and taught by leaders in the field – our instructors hold ACMA credentials and have worked in industry.
- Comprehensive courses integrate skill sets with technology found in industry and supported by industry input.

For more information, please contact department chair, Mike Swietzer, at (360) 766-6282, ext. 3005, or mike.swietzer@skagit.edu.

Program Certificate

ADVANCED COMPOSITES MANUFACTURING TECHNICIAN (31 CREDITS)

Includes required certificate courses. Student schedule may vary based on entry point, credit load, and prerequisites. Consult with department chair or SVC counselor for scheduling options

First Year

Fall	Cr	Winter	Cr	Spring	Cr
CMPST 121	3	CMPST 123	5	CMPST 127	5
CMPST 220	5	MANF 120	3		
MANF 125	3	MANF 122	2		
or MT 105					
†WMATH 100	5				
or †MT 102					
Total	**16**	**Total**	**10**	**Total**	**5**

† Students who do not receive an appropriate test score will require additional coursework to develop necessary skills for entry into class.

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Micro-Certificates

COMPOSITES REPAIR TECHNICIAN (13 CREDITS)

This micro-certificate provides students with an overview of composites and their application across a spectrum of industries. Instruction covers materials commonly used in composite manufacturing processes such as hand lay-up, filament winding, compression molding, resin-transfer molding, and pultrusion. Introduction to fiberglass reinforced plastics with emphasis on chemical safety applicable to poly and vinyl-ester resins, solvents, and epoxies. Students will receive hands-on training in use of molds, gel coats, release agents, resins, cosmetic color matching, and reinforcing materials in hand layup and structural repair. Industry-appropriate shop safety standards and correct use of Personal Protection Equipment is also covered. Required Courses: CMPST 121, 123, and 127.

COMPOSITES WIND BLADE REPAIR (10 CREDITS)

This micro-certificate provides students with an overview of common composite materials and processes, solid laminate and sandwich construction methods, vacuum bagging materials and processes, core materials used in structures and repairs, damage detection methods – including repair methods and techniques. This certificate provides hands-on repair and reconstruction practices, including the use of appropriate tools, such as hot bonders to make composite wind blade repairs. Students learn how to determine the extent of damage, how to remove damaged material, and how to execute proper repair preparation. Required Course: CMPST 128.

Course Descriptions

CMPST 121 Composites Construction and Repair (3)

Introduction to fiberglass reinforced plastics with emphasis on chemical safety applicable to poly and vinyl ester resins, solvents, and epoxies. Hands-on training in use of molds, gel coats, release agents, resins, cosmetic color matching and reinforcing materials in hand layup and structural repair.

CMPST 123 Composite Vacuum Infusion/Light RTM Process (5)

Introduction to vacuum infused plastics. Training in infusion reinforcements, core identification, infusion equipment usage, manifold systems both flow and feed, flow media, bag building, peel ply installation, resin building and infusion techniques employing reusable B side molds. Training in silicone bag building and their usage along with development of rigid B side molds and their usage in Light Resin Transfer Method. Prerequisite: CMPST 121 or instructor approval.

CMPST 127 Advanced Composites Construction and Repair (5)

Introduction to advanced composite manufacturing with emphasis on thermoset prepreg technology. Hands-on training in manufacturing with polyesters, vinylester and prepreg's using common types of advanced fiber reinforcements. Includes OSHA 10 certification.

CMPST 128 Composites Windblade Construction and Repair (10)

Introduction to composite manufacturing and repair of windblades with emphasis on thermoset prepreg technology. Hands on training in manufacturing and repair using VIP/Vacuum Bagging with proper bleeder schedules, hot-bond repairs/heat blankets, and damage inspection repair techniques. Includes OSHA 10 certification.

CMPST 220 Composite Tooling (5)

Theory and application of tooling for the composite industry using various forms of medium. In-depth study and hands-on work building both A and rigid B molds using both manual and computer aided development for plug construction. Prerequisite: CMPST 121 and 126 or instructor permission.