

Composites Technology

Also see Manufacturing and Marine Maintenance Technology

Program Description

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. Students will work toward an industry recognized certification from the American Composites Manufacturers Association (ACMA). Students who choose to specialize in Marine Composites can also earn the American Boat Yacht Counsel (ABYC) industry certification in addition to the ACMA certification.

The use of composite materials is found in the marine, aerospace, construction, energy recreation, bio-medical, automotive, transportation and consumer goods industries. Advanced technologies in materials and production processes ensure that modern composite manufacturing is safer for the employee and the environment. The technical skill competencies required to meet the demands of new and emerging applications will continue to grow, creating further emphasis on the importance of training and certification.

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

COMPOSITES TECHNICIAN CERTIFICATE (33 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.....	5	MANF 120.....	3
MANF 125.....	3	MANF 122.....	2
or MT 105.....		CMPST 123.....	5
†WMATH 100	5	CMPST 126.....	5
or †MT 102			
Total	13	Total	15
		Total	5

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

Micro-Certificate

COMPOSITE FUNDAMENTALS: 18 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 and 123; MANF 120, 122, and 125

Course Descriptions

CMPST 121 Composites Construction and Repair (5)

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 Process (5)

Introduction to vacuum infused plastics. Training in infusion reinforcements, core identification, infusion equipment usage, manifolding systems both flow and feed, flow media, bag building, peel ply installation, resin building and infusion techniques. Prerequisite: CMPST 121 or instructor approval.

CMPST 126 Composite Closed Cavity/Light RTM Process (5)

Advanced part building employing reusable B side molds in closed mold construction. 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 and 123 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 Ocean 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.

MANF 120 Industrial Safety & CPR (3)

Instruction on safety topics and practices specifically related to industrial work environments. Topics include personal protective equipment, safety working with heavy industrial equipment, energy lock-out/tag-out procedures, material handling, electrical safety, machine guarding, working with hazardous materials, fire prevention, hazard identification and control, and safety inspection practices. Instruction in CPR included.

MANF 122 Material Science in Manufacturing (2)

Material Science is a study of the nature, structure, characteristics, and properties of natural and synthetic materials used in contemporary industry. Introduction to the industrial materials most often found in manufacturing operations and facilities ranging from traditional metals, ceramics, and polymers, to advanced engineering materials and composites. Emphasis will be placed on understanding how the structure and properties for industrial uses influence the selection of primary materials and their conversion into useful products.

MANF 125 Precision Measurement and Tools (3)

Introduction to the science of metrology (precision measurement and tolerances), and the basic hand and machine tools commonly used in a manufacturing workplace. Covers the fundamental skills required to perform basic and precision dimensional measurements and an introduction to the concepts of Statistical Process Control (SPC). Gain proficiency in using rules, scales, tape measures, protractor, calipers, lasers, micrometers, dial gage, height gage and coordinate measuring machine. Identification and proper use of a variety of basic hand and machine tools, such as box/open end wrenches, screw drivers, sockets, ratchets, and extensions, plus cutting tool geometry will be covered. Practice using basic power tools such as band saw, drill press and disk sander. Overview of fastenings and methods of fastenings (screws, machine screws, nuts, bolts, etc.), basic wire stripping, terminal crimping and soldering will be included.