



ADVANCED COMPOSITES - CERTIFIED COMPOSITES TECHNICIAN - (CCT - AC)

PRE REQUISITE REQUIRED email cct@acmanet.org for information and questions.

References for Body of Knowledge in Advanced Composites CCT:

ACMA. Basic Composites Manual: Study Guide for Certified Composites Technician Program. Arlington, Virginia: ACMA, 2017. ISBN 978-0-692-94763-0

Dorworth, Louis, Gardiner, Ginger, Mellema, Greg. Essentials of Advanced Composite Fabrication & Repair, Newcastle, Washington: Aviation Supplies & Academics, 2009. ISBN 978-1-56027-752-1

Foreman, Cindy. Advanced Composites, Weyers Cave, VA Avotek Information Resources LLC, 2019. 4th Edition ISBN 978-1-933189-72-7

Federal Aviation Administration (FAA) Staff. Aviation Maintenance Technician Handbook-Airframe Vol 1. Aviation Supplies & Academics, 2013. ISBN 978-1-619-54063-7

Fochtman, Kevin, A Comprehensive Guide to Composites Processes and Procedures from the Professionals. Newcastle, Washington, Aviation Supplies & Academics, 2012. ISBN 978-1-61954-204-4

Strong, Brent. Fundamentals of Composites Manufacturing 2nd Ed., Dearborn, Michigan, Society of Manufacturing Engineers, 2008. ISBN 978-087263854-9

TOPIC	Resource	Body of Knowledge %
Module 1 Matrix and Fiber Technologies in Advanced Composites	Body of Knowledge References	10%
Mixing of resins/adhesives/potting compounds		
Specifications: Identifying prepreg/fabric/tow/resin/adhesive and interpreting purchasing, material, and construction specs		
1. Best practices for reinforcement weave patterns. 2. Fundamentals of reinforcement selection. 3. Comparison of fabric weaves		
Advanced automated production techniques		
Thermoplastic materials		
High temperature material and resin systems		
Module 2 Design Considerations, Composites History and products.	Body of Knowledge References	10%
Process modeling, design software, specification tools		
1. Reading a work instruction and drawing. 2. Hand lay-up best practices. 3. Understand balanced laminate. 4. Understand residual stress.		
Composites Industry history- development of advanced composites.		
Module 3 Molding Methods and Practices for Advanced Composites	Body of Knowledge References	20%

1. Best practices for material handling. 2. Cutting prepreg material. 3. Fundamentals of vacuum bag debulks. 4. Vacuum leak checking/ quality control		
1. Best practices for material control 2. Calculation of time lost in transit. 3. Calculation of out time and working life. 4. Working life and shelf life best practices.		
1. Use of a scale and taring. 2. Resin mix ratios. 3. Best practices for mixing resin. 4. Pot life and storage life. 5. Quality control and verification testing.		
1. Best practices for fiber wet-out. 2. Fundamentals of vacuum debulks. 3. Comparison of fabric types.		
Vacuum Bagging Fundamentals, oven and autoclave basics		
1. Introduction to application of potting compound. 2. Best practice for the application of a potting compound 3. Application of a potting compound. 4. Final preparation of repair area		
Module 4 Health and Safety	Body of Knowledge References	10%
Composite Machining, CNC Automation		
PPE, Hazards, Exposure, Standards for safe manufacture, repair, storage and use of advanced composites.		
Module 5 Core Material Applications	Body of Knowledge References	10%
1. Introduction to sandwich construction. 2. Best practice for sandwich fabrication. 3. Vacuum bagging techniques.		
Co-cure and Co-bonding of skins on core materials (honeycomb, polymeric, etc.)		
Module 6 Tooling for Advanced Composites	Body of Knowledge References	10%
Mold selection, demolding and design		
Mold care, tool and mold prep and maintenance		
Tooling Repairs		
Tooling Material introduction		
Automated Layup Equipment, Fiber Placement		
Module 7 Inspection and Testing	Body of Knowledge References	10%
Composite damage/defect detection and rating		
Non-Destructive Inspection (NDI)		
Quality control and documentation on repairs, layup, inspection		
Data Analysis introduction		
Equipment, records, technology in Inspection and testing		
Module 8 Bonding and Fastening	Body of Knowledge References	10%
Composite-composite and composite-metallic adhesive bonding and mechanical fastening		
Lightning Strike Protection overview and applications		

Module 9 Composite Structure Repairs	Body of Knowledge References	10%
Laminate (monolithic and sandwich) and tooling repair		
Layer identification, scarfing, plie counting,		
Damage Removal, scarfing and repair best practices.		
Hot bonder operations- field repairs		
<p>Pre requisite approval is needed prior to testing for certification. Do not enroll in the Advanced Composite Certified Composites Technician program unless you have prepared required prerequisite materials for submission. Requirements can be met in several ways: 1. Successful completion of an ACMA reviewed advanced composites program that delivers 30 or more hours of hands on training that cover the skills in the prerequisite checklist.(must submit documentation from institution). 2. Verification of one year or more working with an advanced composites fabrication employer. Documentation of employer, employer contact and reference of supervisor or manager for work history verification is required. 3. Any combination of the two previously mentioned prerequisites with online submission of records as requested are acceptable. Please allow two weeks for record review.</p>		