

COMP 217: Advanced Composites Technology III

This course is a combination of classroom and laboratory experience. Introduction will include a brief history of composites. Emphasis will be on composite terminology, adherence to laboratory safety rule, and strict conformance to directions. While this course is intended to form the foundation for advanced composite courses, it will have direct ties to industry- required skills.

Course Student Learning Outcomes

1. Build complex projects to specifications, demonstrating an understanding of fabrication drawings and procedures.
2. Build advanced vacuum bags, including complex shapes, pleats, and layup schedules, and demonstrate comprehension of the theory of vacuum bagging.
3. Fabricate complicated parts using hand wet layup techniques including surface preparation, surface coating, filleting, ply orientation and wet out.
4. Build vacuum infused parts to industry standard level of quality, demonstrating competency with vacuum infusion process (VIP) methods.
5. Fabricate complicated parts using hand prepreg layup methods, demonstrating competency with debulking, thermocouple use, ply orientation and cure cycles.
6. Demonstrate the ability to fabricate a viable composite mold according to industry standards from a supplied dimensional drawing.
7. Compare common fabrication techniques and the tooling required for each. Explain the benefits, drawbacks, and design requirements of each.
8. Explain how the Coefficient of Thermal Expansion (CTE), thermal conductivity, thermal mass, and surface finish affect a mold's performance and lifespan.
9. Employ destructive and non-destructive testing methods to evaluate the quality of a laminated composite part.
10. Describe the technology, benefits, and drawbacks of non-destructive test methods used to verify the quality of a composite laminate, and the proper applications of each.
11. Demonstrate a proper composite material damage removal and repair on a solid laminate and sandwich panel from plan to "ready for paint" using a scarf joint and hot bonder.

Credits: 11

Program: **Advanced Manufacturing / Composites Technology**