The design of structures using advanced composite materials via case studies, examples and problem-solving exercises.

Background

“Advanced composites” are a class of materials that can be manufactured from a range of polymers and reinforcing fibres. Composites can deliver lightweight structures with high stiffness, strength and increased durability that can be formed into complex lightweight components.

Composites is a key enabling technology with uses in an ever-increasing array of industries, but the process of introducing them to a new industry can meet with challenges. Composites behave differently to traditional materials such as steel and aluminum, and an understanding of these differences and use of appropriate design methods to achieve structural integrity will be the focus of this course.

Course Objectives

At completion of this course participants will be able to:

• Select the proper composite materials and manufacturing methods appropriate for an application

• Understand the design principles relevant to composite materials

• Understand common design issues to avoid

• Undertake basic design of structures in composites to ensure performance requirements are met

• Complete design of a composite structure to meet the requirements of the relevant industry design standard.

Program Outline

i. Composite materials: types, properties and behaviour

A brief outline of composite material types, describing their properties and behaviour.

ii. Composite structures: applications and approaches

Use of composite materials in a range of industries, and the drivers for selection of materials will be outlined.

iii. Composites design principles and guidelines

Design practices to ensure effective and efficient composite solutions. Load paths and the relationship with laminate design; design details (including joints, stiffened panels and sandwich panels); key weaknesses of composite structures (including through-thickness stresses, delamination, damage tolerance & residual strength, environment, manufacturing variability and defects).

IV. Composites design methods and design issues

Outline of available composites design methods (including datasheet methods, laminate analysis methods, finite element analysis methods).

V. Industry codes and standards

Relevant industry codes and standards for composite materials will be outlined. In many industry sectors, standards do not cater for composite materials. General pathways for the use of composite materials and methods to demonstrate compliance with existing standards will be explained.
Practical Composites Design & Analysis

Dr Rodney Thomson is Engineering Manager for Design and Analysis at Advanced Composite Structures Australia Pty Ltd (ACS Australia). He is also Engineering Manager at the Cooperative Research Centre for Advanced Composite Structures (CRC-ACS), where he leads projects on crashworthiness and robust design of composite structures. In delivering the course, Rodney will bring over 20 years experience in the design of composite structures for aerospace, defence, marine, land transport, civil infrastructure, oil & gas, and renewable energy applications. ACS Australia is a highly awarded and recognised world leader in composites innovation, helping companies to excel in implementing new composites technology. Dedicated staff bring expertise, professionalism and value to clients worldwide seeking transformative change, enabling them to stay ahead of the competition.

The course is intended for both beginning and more experienced technical personnel, particularly structural, mechanical and civil engineers and composite practitioners. Engineers and managers responsible for specifying and designing structures which may benefit from use of advanced composites will find these seminars extremely informative.

Tuesday 2 September Adelaide

The course will run from **9.00am-5.00pm** at:
Glenelg Golf Club
James Melrose Road
Novar Gardens SA 5040

**$330.00** per person for Composites Australia and CRC-ACS members
**$440.00** per person for non member
**$175.00** per student

Facilitator Information

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**Composites Australia** ABN 28 611 244 813
Registered Association Number YO 9504-23
17 Rooney Street, Richmond Victoria 3121 Australia
Phone +613 9429 9884 Fax +613 9421 5516
Email admin@compositesaustralia.com.au

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* Program and other event details are subject to change. Composites Australia is not liable for any loss or expenses incurred.

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