



A Brief Overview of the FAA Center of Excellence for Advanced Materials in Transport Aircraft Structures

prepared by
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Background – FAA Centers of Excellence (COEs)

FAA Centers of Excellence (COEs) are:

- Funded through cooperative agreements between academic institutions, their affiliate industrial partners, and the FAA.
 - Funded in three “phases” over a total period of 10 years (expected to be self-supporting thereafter).
 - Seven FAA-COEs currently exist (for details see <http://www.coe.faa.gov/>)
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Background – Joint Advanced Materials and Structures COE

- Joint Advanced Materials and Structures (JAMS) Center of Excellence established in 2004, co-led by the University of Washington (UW) and Wichita State University (WiSU)
 - UW: Center for Advanced Materials in Transport Aircraft Structures (AMTAS)
 - WiSU: Center of Excellence for Composites and Advanced Materials (CECAM)
 - Activities carried out by UW-AMTAS and WiSU-CECAM are coordinated by the FAA Program Manager, Mr. Curt Davies
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AMTAS Mission

- Perform research studies
 - Provide educational/training opportunities
 - Facilitate knowledge transfer
- ... pertinent to the use of advanced materials in transport aircraft
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AMTAS Participants

Academic Partners:

- University of Washington (UW)
 - Washington State University (WaSU)
 - Oregon State University (OSU)
 - Edmonds Community College (EdCC)
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AMTAS Participants

Current Industry Partners



AMTAS Meetings

- Semi-annual meetings of AMTAS academic/industrial partners:
 - 29 Jan '04: UW campus, 30 attendees
 - 10 Nov '04: UW campus, 41 attendees
 - 14 April '05: EdCC campus, 53 attendees
 - 13 Oct '05: UW campus, 55 attendees
 - 11 Apr '06: UW campus, 51 attendees
 - 19 Oct '06: EdCC campus: 50 registrants
 - Objectives
 - Report/discuss AMTAS activities past/future
 - Spring mtg focus: plan for future
 - Fall mtg focus: present research results
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JAMS Meetings

all AMTAS and CECAM participants

- JAMS 2005: 24-26 May 2005, Wichita, KS; ~ 100 attendees
 - JAMS 2006: 20-22 June 2006, Seattle, WA; ~90 attendees
 - JAMS 2007: date/location TBA (*tentative*: Hughes Research Ctr, Atlantic City, NJ)
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Current AMTAS Projects

- Reliability-based Damage Tolerant Composite Design Methodologies (Lin, UW)
 - Aeroservoelastic effects in Composite Aircraft (Livne, UW)
 - Adhesive Bonding: Surface Characterization (Flinn, UW)
 - Adhesive Bonding: Effects of Surface Pretreatments (Smith, WaSU)
 - Short Course Curriculum Development: Maintenance of Composite Aircraft Structures (Seaton, EdCC)
 - Modeling Progressive Damage in Composite Aircraft Structures (Kennedy, OSU; to begin Spring '07)
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Modeling Progressive Damage in Composite Aircraft Structures

- Project PI: Prof. Tim Kennedy, Dept Mechanical Engineering, Oregon State University
- Specific project goals/deliverables to be finalized October 2006
- Expected to provide FEM-based progressive damage models for inclusion in "Reliability-based Damage Tolerant Composite Design Methodology" under development by K.Y. Lin



AMTAS Short Course

AMTAS Institute on Adv Aircraft Composites

- Five-day intermediate-level course
 - First offered 18-22 Sept '06 with 23 students:
 - Boeing (Seattle, Wichita, Long Beach): 14
 - C&D Zodiac: 5
 - Cytek (UK): 1
 - Trulife: 1
 - Wright-Patterson AFB: 1
 - Commercial Aviation Services: 1
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AMTAS Short Course

Curriculum and Instructors

Day 1	Overview/New Develop Lin (UW), Stickler (Boeing)	Materials Flinn (UW), Das (UW)
Day 2	Tooling Dickson (Boeing)	Manufacturing I Das (UW), Soleiman (Boeing)
Day 3	Analysis Methods Lin (UW)	Design Methodologies Eastman (Boeing)
Day 4	Manufacturing II McCarville (Boeing)	Test Methods Tuttle (UW), Pomeroy (INTEC)
Day 5	Prod Lifecycle Management Richey/McPherson (Boeing)	Nondestructive Inspection Swartz (FAA)



AMTAS Short Course

- Next offering (tentatively) scheduled for 19-23 March 2007
 - Updates posted at:
<http://depts.washington.edu/amtas/courses/ShortCourses.html>
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