Turbomachinery Design Training Week

February 16 – 19, 2021

Agenda

Day 1: Tuesday, February 16, 2021 – Thermodynamics, Cycles, and Components	
9:00 a.m. – 9:05 a.m.	A. Introductions and Welcome (*Dr. Tim Allison)*
9:05 a.m. – 9:35 a.m.	B. Basic Thermodynamics of Heat Engines and Power Cycles Including PV Diagrams, TS Diagrams, Carnot Cycle, and Brayton Cycle (*Dr. Jeff Moore*)
9:35 a.m. – 10:30 a.m.	C. Component Overview: Compressors and Expanders (*Dr. Jeff Moore*)
10:30 a.m. – 10:40 a.m.	Break
10:40 a.m. – 11:00 a.m.	D. Virtual Tour – B278 (*Dr. Jeff Moore*)
11:00 a.m. – 12:00 p.m.	E. Component Overview: Basics of Combustors and Sizing (*Mr. Seth Cunningham)*
12:00 p.m. – 1:00 p.m.	F. Cycle Analysis and Optimization/NPSS Teaser (*Mr. Charles Krouse*)
Day 2: Wednesday, February 17, 2021 – Aerothermal Design of Compressors and Expanders	
9:00 a.m. – 10:00 a.m.	A. Overview of the Design Process (*Dr. Natalie Smith*) B. Selection of Machine Type: Radial/Axial/PD (*Dr. Natalie Smith*)
10:00 a.m. – 11:00 a.m.	C. 1-D Design Process (*Mr. Grant Musgrove*)
11:00 a.m. – 11:10 a.m.	Break
11:10 a.m. – 12:10 p.m.	D. Blade Definition and Flow Distribution i. Axial (*Dr. Natalie Smith*) ii. Radial (*Dr. Natalie Smith)*
12:10 p.m. – 1:00 p.m.	E. CFD Analysis (*Ms. Ellen Smith*)
Day 3: Thursday, February 18, 2021 – Rotordynamics and Blade Dynamics	
9:00 a.m. – 10:05 a.m.	A. Rotordynamic Analysis (*Mr. Aaron Rimpel*)
10:05 a.m. – 10:30 a.m.	B. Bearings and Seals (Dr. Tim Allison)
10:30 a.m. – 10:55 a.m.	C. Instrumentation (*Dr. Tim Allison*)
10:55 a.m. – 11:05 a.m.	D. Live Demo of Rotor Rig (*Mr. Aaron Rimpel*)
11:05 a.m. – 11:15 a.m.	Break
11:15 a.m. – 11:45 a.m.	E. Introduction to Blade Dynamics (*Dr. Tim Allison*)
11:45 a.m. – 12:30 p.m.	F. Aeromechanical Design (*Mr. Aaron Rimpel*)
12:30 p.m. – 1:00 p.m.	G. LCF Life Estimation (*Mr. Charles Krouse*)
Day 4: Friday, February 19, 2021 – Machine Integration and Detailed Design	
9:00 a.m. – 9:30 a.m.	A. Machine Design Introduction (Conceptual/Detail Design) (*Dr. Jeff Moore*)
9:30 a.m. – 10:00 a.m.	B. 2-D Layout (*Mr. Jonathan Wade*)
10:00 a.m. – 10:50 a.m.	C. Case and Internal Component Design and Pressure Containment (*Mr. Stefan Cich*)
10:50 a.m. – 11:00 a.m.	Break
11:00 a.m. – 12:45 p.m.	D. Detail Design Topics (*Mr. Aaron Rimpel*)
12:45 p.m. – 12:55 p.m.	E. Materials (*Mr. Stefan Cich*)
12:55 p.m. – 1:00 p.m.	F. Wrap up (*Dr. Jeff Moore*)