Flight Software Workshop Agenda
Day 1 - Monday, October 17, 2022, 8:30 am - 4:00 pm

Type	Topic/Activity	Presenter	Time	Duration
Introduction		J. Levison	8:30	10
Presentation	01 Spacecraft Archtecture and System Overview	T. Canham	8:40	20
Presentation	02 FSW System Engineering - Capability Layers	T. Canham	9:00	60
	Drivers			
	Services			
	Applications			
Break			10:00	15
Presentation	03 FSW Architecture, Requirements & Design	G. Watney	10:15	60
	Software architecture			
	Software requirements			
	Structural analysis			
	Data flow diagrams			
	Software design			
	State machine models			
Presentation	04 F' Introduction	T. Canham	11:15	45
	05 FPP Introduction	R. Bocchino	12:00	15
Lunch			12:15	60
Exercise	Lab project introduction	M. Starch	1:15	15
	Lab project setup	M. Starch	1:45	15
	Lab project system requirements	M. Starch	2:00	30
Break			2:15	15
Presentation	06 FSW Design	M. Starch	2:30	90
	FSW system modeling in F' (Types, ports, components, topology definitions)			
	Data types, interfaces			
	Commands, telemetry events, parameters and data products			
	Concurrency, initialization, memory allocation			
	OS abstraction layer (message queues, mutex, tasks, file system)			
	Interface design patterns			
	Serializing and deserializing data			
	Designing and visualizing topologies			

Day 2 - Tuesday, October 18, 2022, 8:30 am - 3:30 pm				
Type	**Topic/Activity**	**Presenter**	**Time**	**Duration**
Exercise	Writing FPP models for lab project	M. Starch	8:30	90
	FSW Implementation in F'			
	Component level implementation			
	Filling in component handlers			
	Sending telemetry, events			
	Using parameter values			
	Directly invoking ports			
	Deployment level implementation			
Break			10:00	15
	07 Reducing Risk	K. Havelund	10:15	45
	Defensive coding			
	Avoiding C and C++ pitfalls			
	Static and dynamic analysis			
	08 Suggestions for Coding Style	R. Bocchino	11:00	45
	Modules and Components			
	Functions			
	Expressions and Statements			
	09 Basic Data Structures	R. Bocchino	11:45	30
	Implementation			
	When to choose which one			
Lunch			12:15	60
Exercise	Implementing components and topology for lab project	M. Starch	1:15	135
Lab Tour (optional)			3:30	60

Day 3 - Wednesday, October 19, 2022, 8:30 am - 4:00 pm				
Type	**Topic/Activity**	**Presenter**	**Time**	**Duration**
Presentation	10 Unit Testing	R. Bocchino	8:30	30
	Basic principles of testing			
	Writing modular tests			
	Achieving and checking code coverage			
	Picking good inputs			
	11 F' Unit Test Framework	R. Bocchino	9:00	30
Exercise	Writing unit tests for lab project	R. Bocchino	9:30	60
Break			10:30	15
Presentation	12 Systems Testing	M. Starch	10:45	60
	F' GDS overview			
	Test API			
Lunch			11:45	60
Exercise	Lab assignment system testing using the GDS	M. Starch	12:45	90
Presentation	13 FSW Development Process	A. Rizvi	2:15	60
	FSW level process - waterfall model, artifacts, reviews			
	Component level process - checklists, reviews			
	FSW planning and reporting			
Presentation	14 Open Source Ecosystem			
	F'	M. Starch	3:15	30
	AMPCS	L. Stewart	3:45	15