

AFMG Acoustics and EASE Simulation Training

by

Sound Wizard

AGENDA

DAY 1

10:00 am	Welcome	Opening Presentation
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10:10 am	Key Acoustic Principles	Required Key Principles of Acoustics:
		a. Absorption Coefficients
		b. Reverberation Time
		c. Ambient Noise
		d. Sound Levels
		e. Speech Intelligibility Criteria & Prediction

11:30 am	BREAK	
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11:45 am	EASE Overview v2.0	EASE General Overview	
		Introduction	
		a. Class objectives establishing an understanding of theory, capabilities, limits and efficient use	
		b. History and background of EASE	
		Concept of and Need for Acoustical Simulation	
		a. What is simulation?	
		b. Why do we need simulation? Feasible approach to predict rooms/systems behavior -vs- analytical methods	
c. Simulation techniques Statistical, wave-based and ray-tracing			

1:00 pm	LUNCH	
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2:00 pm	L1 + Audi 2 Model	Basic Modules Exploration and General settings Overview
		a. EASE structure
		b. Database materials and speakers
		c. Room editor Items, perspectives and data checking
		d. Area mapping system tuning
		e. Eyes rendering, performing calculations and viewing results
		f. Rays simple ray tracing
		g. Vision visual 3D rendering
		h. EARS Auralization
		i. Import/Export
		j. Room data settings statistics, reverberation, noise and power settings

2:00 pm	Audi 1 Model	Hands on Exercise
		a. Inserting speakers / duplicating
		b. Mapping without delays
		c. Time alignment methods
		b. Mapping with delays
		e. Clusters building, saving, importing, exploding

3:45 pm	BREAK	
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4:00 pm	Audi 2 Model	Room Modeling Theory	
		a. EASE Model Items	
		i. Vertices / Edges coordinates	
		ii. Faces boundary vertices, material, folds, coating	
		iii. Loudspeakers	
		iv. Audience areas boundary nodes, shift	
			v. Listener's seats coordinates, orientation
	L1 Audi1 Model	b. Objects	
		i. Definition Items, reference point and angle	
		ii. Advantages of using objects group actions	
		c. Tables	
i. Different types of tables			
		ii. Advantages of using tables group actions	

DAY 2

10:00 am	L1 + Audi1 Model	Material Database
		a. Format of material data
		i. Absorption coefficients checking in eyes
		b. Adding new materials Interpolation
		c. Using Excel sheets
		Reverberation time formulae and their limits (Eyring / Sabine)
	Soundflow Software	Using SoundFlow (demo with hands on)

11:30 am	BREAK
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11:45 am	L1 + Audi 2 Model	Loudspeakers and mapping	
		.SPK Speaker database	
		a. Format of speaker data	
		i. Types of speaker data files SPK, DLL and GLL	
		ii. Attenuation table horizontal/vertical planes and interpolation	
		e. Speaker cases	
		.DLL Modeled speakers embedded programs for configuring arrays – special room data setting	
		.GLL modeled speakers	
		a. Shortcomings of other methods configurable arrays, multi-way loudspeakers, ...	
		b. Advantages of the GLL solution	
		Line array simulation in EASE	
		a. What are line arrays?	
i. Concept cylindrical radiation			
ii. Advantages versus conventional loudspeakers coverage, spreading loss, steerability....			
b. Modeling line arrays in EASE			
i. Near/far field considerations			
ii. Balloons of line arrays disc-shaped balloons			

1:00 pm	Lunch
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2:00 pm	Audi 1 Model	Speaker time alignment
		Inserting speakers $\pm 6/-5/8$ 6°H 30°V and $\pm 6/-23/15$ 0°H 30°V
		Time alignment hands ON – stage 0/-2.5/2.5 (24ms & 72ms)

3:45 pm	BREAK
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4:00 pm	Audi 2 Hands On	Looking at the rendered model and first calculations in standard mapping hands-on model
		a. Eyes settings and options
		b. Views
		i. Dyes white, material, face, alpha, random
		ii. External
		iii. Item
		c. Standard mapping
		i. Settings patch, shadow, interference
ii. Limits		

DAY 3

10:00 am	3D Modelling	Geometrical entry methods
		i. Prototypes
		ii. Three-dimensional shapes cuboid, cylinder, cupola, pyramid, cone
		iii. Room manual entry – starting

11:30 am	BREAK
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11:45 am	Full Modelling Exercise	iv. Import/Export – Sketch-up
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1:00 pm	BREAK
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2:00 pm	Potential Causes and Remedy of Holes	
	Audi 2 Hands On (Finish)	Auditorium 3D mapping, ray tracing and acoustical design
		d. Viewing standard mapping results
		i. Map types SPL, energy ratios, intelligibility
		ii. Frequency perspective
		iii. Distribution
		iv. STI options Standard, male/female, STIPA, with/without noise and masking
v. Exporting standard mapping results pictures and values		

3:45 pm	BREAK
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4:00 pm	Audi 1 Hands On	Loudspeaker clusters and arrays
		a. Clusters
		i. Building clusters reference point/angle and calculation method
		ii. Using clusters Individual components embedded in the cluster
		b. Arrays
		i. Building arrays
		ii. Using arrays Individual components still accessible
c. Clusters versus arrays		

DAY 4

10:00 am	From AFMG L2 program	
	FIRmaker	FIRmaker
	Speech Intelligibility Summary	Speech intelligibility = $f(\text{RT}, \text{SPL}, \text{NC})$
	AFMG Products	EVAC, FOCUS, Reflex, etc...
		Geometrical Acoustics (L2)
		Validity
		Scattering
		Rules in CAD
		Curved surfaces
		Modeling all elements (L2)
		Sources
		Boundaries
		Mediums
		Listeners
		Ray tracing (L2)
Formats		
Tail		

11:30 am	BREAK
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11:45 am	AURA Module	AURA mapping Hands-on Model
		a. AURA versus classical ray tracing impacts
		b. Calculation settings overview
		Aura response
		a. Binaural hearing and HRTF
		b. Impulse response and convolution hands-on model
	Accuracy/calculation-time trade-off for different calculation methods	
	EARS Module	EARS (L2)
		a. File formats
		i. RSP files
ii. BIR files		
iii. WAV files		
Audio Files	Demo Harris Scoring Hall (20 min) → on nearfield system	

1:00 pm	LUNCH
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2:00 pm	Home Theatre Hands On	Reflection free zone and simple ray tracing – small room acoustics + wave files
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3:45 pm	BREAK
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4:00 pm		Exploring all remaining modules & settings
		Main options (Home page)
		Databases update
		License management (EASE Guard)
		Create status reports (to AFMG in case of problem)
		Reporting (JPG – PDF export) – high resolution jpg & pdf
		Pack & localise projects (IMEX module)
		Calculate scattering (Material database)
		Sound Wizard's recommendations
		Our process at Sound Wizard (xls sheets)
		Materials assessment – tips & tricks
		Other useful AFMG software – INSUL demo
		Final Questions & Answers
	Certificates	
	Fill up questionnaires	

Optional - Time Based	Audi 2 Hands On	RT60 optimization employing EASE to find the right acoustical treatment	
	AFMG Reflex Presentation	Using Reflex (no demo, just presentation)	
	EASE FOCUS 3	EASE FOCUS 3	
			Auto Optimization
			Export to EASE
	AURA		AURA hands-on, including local decay time
			Auralization demo