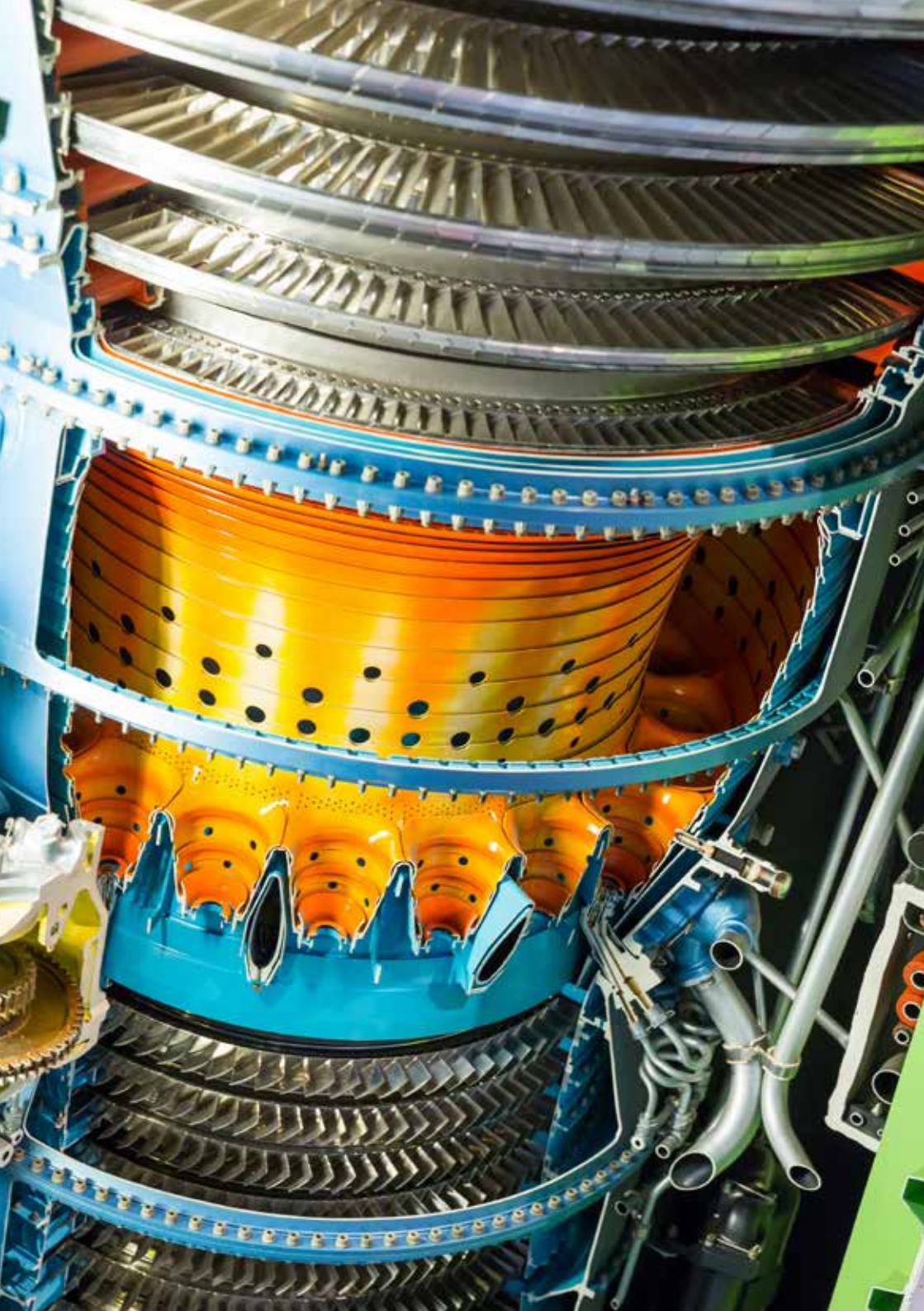


# Noise Control, Aeroacoustics And NVH

**ADVANCED COURSES**

10 - 14 September 2018



# ADVANCED COURSES

### Course features

- World-class lecturers: the course presents a unique opportunity to learn from and talk to lecturers at the very forefront of their fields. Delegates are encouraged to discuss their problems in and out of class.
- A renowned institution: the ISVR has over 50 years' experience delivering high-quality education to engineering students and professionals, and is at the forefront of research in many areas of sound and vibration.
- Flexibility: there are two distinct streams but we offer the flexibility to mix lectures, according to your interests.
- Facilities: you will have the opportunity to tour our extensive facilities, including one of the largest anechoic chambers in the country.
- Course dinner: a dinner towards the end of the course provides the opportunity to meet with other delegates and members of staff.

### Location

The course will be held in Building 13 on the University of Southampton's main Highfield Campus, just 10 minutes' walk from University accommodation.

### Fees

Our residential option includes accommodation in a university hall of residence (all-inclusive), Sunday\*-Thursday inclusive (full five-day course) or Tuesday-Thursday inclusive (three-day Advanced Course only).

Both fees include course literature for your chosen stream and a course dinner on Thursday evening. Literature for the second stream can be purchased for an additional £100.

	Refresher course <b>plus</b> advanced course	Advanced course only
Non-residential	£1450	£1250
Residential	£1650	£1450

There is a discount of £100 for applications received before 1 July 2018.

*\*No dinner is provided on Sunday evening*

### Aeroacoustics

The Advanced Course in Aeroacoustics provides an introduction to the phenomena involved in the prediction and control of flow generated by noise, with an emphasis on the physics and modelling that underpin predictive acoustic analysis.

This course is suitable for anyone working in areas where flow noise is a major issue. The course would benefit both consultants and researchers in aeroacoustics with any level of experience. A degree-level qualification in a physical science or engineering is desirable, though not absolutely necessary.

### Noise Control

The Advanced Course in Noise Control outlines the underlying principles of noise control, examines the character of noise in some key applications and discusses how noise may be reduced by design or palliative treatment. The Advanced Course in Noise Control is divided into three sections: Basic Principles, Techniques and Applications, and Case Histories.

This course is suitable for anyone working in noise control consultancy or research. The course would benefit both those with extensive experience in noise control who wish to further their understanding of its principles, or those new to the field. A degree-level qualification, or equivalent, in a physical science or engineering is desirable, though not absolutely necessary.

### Automotive NVH

The Advanced Course in Automotive NVH aims to review the origins, characteristics, analysis methods, and control of noise and vibration of road vehicles and their prime movers.

This course is primarily aimed at engineers in design, development, research, and applications. The three days provide an intensive presentation of fundamental principles of engine and vehicle noise and vibration generation and control.

# REFRESHER

## Monday 10 September (Refresher Day 1)

08.30–09.00	Registration	
09.00–09.15	Introduction	
09.15–10.15	Fundamentals of Sound Propagation	P F Joseph
10.30–11.30	Basic Concepts in Vibration	N S Ferguson
11.45–12.45	Fundamentals of Signal Processing, Signals and Systems, Fourier Methods 1	P R White
12.45–13.45	Lunch	
13.45–14.45	Human Response to Vibration	Y Ye
15.00–16.00	Free and Forced Vibration	E Rustighi
16.15–17.15	Fundamentals of Signal Processing, Signals and Systems, Fourier Methods 2	P R White
17.30	Drinks Reception	

## Tuesday 11 September (Refresher Day 2)

09.00–10.00	Three-Dimensional Sound Fields	P F Joseph
10.15–11.15	Human Response to Sound	R H Self
11.30–12.30	Random Processes, Correlation Functions and Spectra, System Identification	P R White
12.30–13.30	Lunch	
13.30–14.30	Acoustic Source Models	P F Joseph
14.45–15.45	Classical Vibration Control	M J Brennan
16.00–17.00	Structural Wave Motion	N S Ferguson

# AEROACOUSTICS

## Wednesday 12 September (Advanced Day 1)

09.00–10.00	Introduction to Aeroacoustics	G Gabard
10.15–11.15	Propagation Effects 1	G Gabard
11.30–12.30	Propagation Effects 2	G Gabard
12.30–13.30	Lunch	
13.30–14.30	Duct Acoustics – Fundamentals	P F Joseph
14.45–15.45	Duct Acoustics – Absorption and Scattering	A McAlpine
16.00–17.00	Aeroacoustic Measurements	K R Holland
17.15–18.15	Tour of ISVR	

## Thursday 13 September (Advanced Day 2)

09.00–10.00	Simple Sources of Noise	G Gabard
10.15–11.15	Automotive Aeroacoustics	P F Joseph
11.30–12.30	Jet Noise 1	R H Self
12.30–13.30	Lunch	
13.30–14.30	Jet Noise 2	R H Self
14.45–15.45	Turbomachinery Noise: Tones	A McAlpine
16.00–17.00	Computational Aeroacoustics - Propagation	G Gabard
19.00	Off-site Course Dinner	

## Friday 14 September (Advanced Day 3)

09.00–10.00	Duct Liner Design and Performance	P B Murray
10.15–11.15	Reactive Duct Silencer Design	M J Brennan
11.30–12.30	Airframe Noise and Installation Effects	D Angland
12.30–13.30	Lunch	
13.30–14.30	Turbomachinery Noise: Broadband	P F Joseph
14.45–15.45	Computational Aeroacoustics – Sources	J W Kim

# NVH

## Wednesday 12 September (Advanced Day 1)

09.00–10.00	Noise and Vibration Measurements	C Karatsovis
10.15–11.15	Characteristics of Automotive Noise	S Roberts
11.30–12.30	Lower Frequency Power-unit Forcing	S Roberts
12.30–13.30	Lunch	
13.30–14.30	High Frequency Power-unit Noise	J Dixon
14.45–15.45	Tyre and Road Noise	S Roberts
16.00–17.00	Inlet/Exhaust Noise	J Dixon
17.15–18.15	Tour of ISVR	

## Thursday 13 September (Advanced Day 2)

09.00–10.00	Applied Signal Processing	D Rhodes
10.15–11.15	Automotive Aeroacoustics	P F Joseph
11.30–12.30	Vibration Testing and Modal Analysis	T P Waters
12.30–13.30	Lunch	
13.30–14.30	Sound Quality	J Cheer
14.45–15.45	Sound Identification and TPA	S Roberts
16.00–17.00	Body Acoustics and Inertior Trim	D Thurgood
19.30	Off-site Course Dinner	

## Friday 14 September (Advanced Day 3)

09.00–10.00	Hybrid and Electric Vehicle Noise	J Dixon
10.15–11.15	Vehicle NVH Strategy	N Pattie
11.30–12.30	Active Control	S Roberts
12.30–13.30	Lunch	
13.30–14.30	Anti-vibration Mounting	T P Waters
14.45–15.45	Exterior Noise and Pass-by	S Roberts

# NOISE CONTROL

## Wednesday 12 September (Advanced Day 1) Basic principles

09.00–10.00	Principles of Noise Control 1	P F Joseph
10.15–11.15	Principles of Noise Control 2	P F Joseph
11.30–12.30	Basic Acoustic Measurements	K R Holland
12.30–13.30	Lunch	
13.30–14.30	Vibration Control for Reduced Noise	M J Brennan
14.45–15.45	Numerical Methods in Acoustics	G Gabard
16.00–17.00	Vibroacoustics	N S Ferguson
17.15–18.15	Tour of ISVR	

## Thursday 13 September (Advanced Day 2) Techniques

09.00–10.00	Identifying and Ranking Origins and Radiators of Noise	M G Smith
10.15–11.15	Beamforming and Inverse Methods	K R Holland
11.30–12.30	Sound Intensity and Sound Power Measurement	P F Joseph
12.30–13.30	Lunch	
13.30–14.30	Active Control of Sound	S J Elliott

## Applications and case histories

14.45–15.45	Case Studies in Noise Control	A J Varley
16.00–17.00	Control of Road Vehicle Noise	S Roberts
19.30	Off-site Course Dinner	

## Friday 14 September (Advanced Day 3)

09.00–10.00	Sound Absorbent Duct Design	M G Smith
10.15–11.15	Reactive Duct Silencer Design	M J Brennan
11.30–12.30	Metamaterials and Active Metamaterials for High Performance Noise Control	J Cheer
12.30–13.30	Lunch	
13.30–14.30	Active Control of Structurally Radiated Sound	M J Brennan
14.45–15.45	Workshop	P F Joseph & M J Brennan

Since its foundation in 1963, the ISVR has become widely acknowledged as one of the world's foremost centres for the study of sound and vibration phenomena. Its achievements have been based upon success in the execution of three key areas:

## Education

The ISVR is unique in its ability to offer degree programmes and continuing professional development in a comprehensive range of subjects related to sound and vibration. Short courses are offered to industry on a regular basis, with tailor-made options available on request.

## Research

The ISVR is a centre for postgraduate and postdoctoral research. ISVR has a number of research groups covering an extensive range of subjects: acoustics, structural dynamics, human sciences, audiology, fluid dynamics, vehicle dynamics, signal processing, active noise and vibration control and instrumentation.

## Consultation

The ISVR is a centre for putting research into practice. ISVR Consulting provides expertise in a wide range of topics, including environmental, and industrial noise and vibration, hearing, and vibration-induced injury assessment and conservation, design, vehicle and engine design and refinement (NVH). The unit operates a range of facilities including large anechoic and reverberation chambers, engine test cells, a progressive wave tube, and a blast wave generator. It can also call upon the expertise of the ISVR academic staff for specialist applications.

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**Course dates:** 10–14 September 2018



**Book online at:**

[store.southampton.ac.uk](http://store.southampton.ac.uk)

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Closing date: 31 August 2018

