UNIVERSITY OF SALFORD FORM MS

MODULE SPECIFICATION

Please contact the Quality Enhancement Office for guidance completing this form on QEO-General@salford.ac.uk

This form is available to download from http://www.governance.salford.ac.uk/page/aqa_forms

Date of completion of this version of Module Specification: 31/03/2017				
Date of approval by the PARP: 09/05/2017 Editorial amend: 21/02/2018				
1. Module Title: (Full title and short title no more than 30 characters) Computer Simulation for Acoustics L6				2.CRN: 52851
3.University module code: H341 30040			4.HESA/JACS subject area code[i]: H341	
5.Level: Level 6	6.Credit Value: 20	7.ECTS Value[ii]: 10	8.Length of module in semesters: 1	9.Month(s) in which to be offered[iii]: February
10.Module Status[iv] New	11.Title of Module being replaced *(if any):* Computer Simulation CRN 39373			12.With effect from[v] (academic year): September 2018
13.Originating School: School of Computing, Science & Engineering	14.Module Leader(s) Jonathan Hargreaves			

15.Programme(s) in which to be offered[vi]:

BEng (Hons) Acoustical & Audio Engineering
BEng (Hons) Acoustical & Audio Engineering with Professional Experience
MEng (Hons) Acoustical & Audio Engineering
MEng (Hons) Acoustical & Audio Engineering with Professional Experience
BSc (Hons) Physics with Acoustics
BSc (Hons) Physics with Acoustics with Professional Experience
MPhys (Hons) Physics with Acoustics
MPhys (Hons) Physics with Acoustics with Professional Experience

16.Pre-requisites *(between levels):* None	17.Co-requisites *(within a level):* None

18.Indicative learning hours (breakdown of hours required)[vii] 200

Lecture	44	Fieldwork	
Seminar		External visits	
Tutorial		Work based learning	
Project supervision		Guided independent study	156
Demonstration Practical classes and workshops		Placement	
Supervised time in studio/workshop		Year abroad	
Other – please specify[viii]			

19.Percentage of module taught by School(s) other than originating School: 0%

20.Aims of Module[ix]: (maximum of 5)

1. To introduce a systematic understanding of the principles of computer simulation methods that are commonly used in acoustics.
2. To develop a critical awareness of the different types of computer simulation techniques available (e.g. low & high

frequency models) and the ability to apply them.
3. To enable self-directed learning of these techniques through modelling of practical acoustical systems.
4. To communicate the conclusions of analysis to specialist audiences.

21.Intended Learning Outcomes[x]

Knowledge and Understanding (maximum of 5)[xi]
On successful completion the student will be able to:

1) Understand and apply the basic principles of computer simulation techniques: geometric room acoustics, finite element method, and boundary element method.
2) Solve problems using computer modelling of acoustical systems.
3) Evaluate the applicability, accuracy and limitations of the computer simulation methods.

Transferable/Key Skills and other attributes (maximum of 5)
On completion the student will have had the opportunity to:

4) Develop skills in problem solving, communication, information retrieval, and the use of both general and specialist IT facilities
5) Manage their assignment demands, self-learning, time management and self-study.
6) Apply skills of engineering analysis and numeracy, though application of and comparison between numerical models.

22. Module mark calculation: Method A

23.Assessment components (in chronological order of submission/examination date)
Denote final assessment component in box marked **final assessment component (99)**

Type of assessment	Identify which ILO is met by number[xii]	Weighting %	Duration	Word count	Component pass required[xiii]	E Submission	Assessment organised by
					Choose an item.	Choose an item.	Choose an item.
Coursework: Assignment 1	1-6	50		2000	No	Yes	School
Final assessment component (99) Coursework: Assignment 2	1-6	50		2000	No	Yes	School

24. Is ethical approval for the module required?	No	25. Is ethical approval for an assessment component required?[xiv]	No

26.Learning, teaching and assessment strategies:

This module is co-delivered with Computer Simulation for Acoustics at level 7. Level 6 and 7 students attend the same class sessions and engage with each other in the seminars and tutorial sessions. Learning outcomes and assessment strategies are different for L6 and L7.

- The module will be delivered on-site in a PC suite where students will use the class time for a discussion of the material and the tutorial questions.
- The module is centred on a weekly programme of directed reading, supported by a detailed study guide and sets of tutorial questions.
- All students will be expected to read the material and attempt at least some of the tutorial questions for each week before the class.
- The module will make good use of the strong research track record of Salford in computer simulation of acoustics by exposing students to current research ideas, often via the researchers themselves.
- Formative feedback will be given by support with the tutorial problems and discussions, both in class and via the VLE. Peer-marked revision tests (on the VLE) are used as formative assessment to drive consolidation of knowledge and measure learning.
- The assignments will typically ask students to use computer-based acoustic modelling software to analyse a case

study problem, within which they'll have to assume certain properties or data (e.g. material or algorithm parameters). It will require students to use both general purpose mathematical modelling software such as Matlab and specific numerical tools such as finite element and boundary element modelling software.

27.Syllabus outline:

- Geometric room acoustic modelling & its relation to statistical room acoustics
- Finite element method for modal analysis and frequency response studies
- Boundary element method for acoustic radiation modelling
- Material characterisation: absorption and scattering mechanism
- Application of software packages to acoustics case study problems
- Current research topics in algorithm development

28.Indicative texts and/or other learning materials/resources[xv]:

Kuttruff, "Room acoustics", Taylor & Francis, London (2009).

Vorländer, "Auralization: fundamentals of acoustics, modelling, simulation, algorithms and acoustic virtual reality" Springer, Berlin (2011)

Cox & D'Antonio, "Acoustic absorbers and diffusers" Taylor & Francis (2017)

Sakuma, Sakamoto & Otsuru, "Computational Simulation in Architectural and Environmental Acoustics: Methods and Applications of Wave-Based Computation" Springer, Tokyo (2014)

Liu & Quek, "The Finite Element Method: A Practical Course", Elsevier Science, Burlington (2013)

After initial approval, up to date reading lists can be accessed at https://salford.rl.talis.com/index.html

For Office Use only:

QEO Comments:	Editorial amend: 21/02/2018 to add BSc (Hons) Physics with Acoustics BSc (Hons) Physics with Acoustics with Professional Experience MPhys (Hons) Physics with Acoustics MPhys (Hons) Physics with Acoustics with Professional Experience to box 15 with effect Sept 2018

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i See UoS guidance notes on selecting JACS codes (http://www.planning.salford.ac.uk/jacs_codes/) see HESA JACS Codes webpage http://www.hesa.ac.uk/index.php/content/view/356/233/

ii The ECTS value is half of the module credit value.

iii Please indicate the month (s) in which delivery of the module will commence.

iv Amendments to the title or credit value constitute a new module.

v If the delivery month of the module is to be available for different intakes of a programme, please indicate this here. E.g. Module effective from Sept 2014 – to state the module is to be available for Sept 2014 intake & Feb 2014 intake.

vi The module will only be attached to programmes specified in this section. Any approved module can be available as a stand-alone module.

vii These categories are used for the Key Information Set which currently applies only to full time undergraduate students only but please include for all students – for more information including definitions see http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/contact_hours.pdf and http://www.hesa.ac.uk/component/option,com_studrec/task,show_file/Itemid,233/mnl,13061/href,Calculations_methods.html/#LearningandTeaching

viii The 'other' category should not be used for learning undertaken by full undergraduate students as 'other' is not used in KIS categories.

ix The aims should express the purpose of the module.

x The intended learning outcomes should detail the knowledge, understanding and skills that students will be able to demonstrate on successful completion.

xi In some circumstances it may be necessary to have more than 5 intended learning outcomes. You will be asked to provide your rationale for this in discussion at the PARP.

xii For example, if the assessment is an essay and the essay meets ILOs number 1-4 and 6-7, state 1-4,6-7.

xiii If Method B is used for module mark calculation, indicate Yes to specify the assessment component(s) to be passed in order to pass the module

xiv Please specify component(s) for which ethical approval is required.

xv The "Indicative texts and/or learning materials/resources" box should include a maximum of five items for new modules. These should be formatted using the University's agreed referencing style for the subject area (usually APA Harvard System 6th). See http://www.salford.ac.uk/library/infolit/tool#referencing_tab for more information. The texts should normally be recent texts (i.e. within the last six years) unless they are a particularly "classic" text. For existing modules, the "Indicative texts and/or learning materials/resources" box should include a link for PARP reviewers and readers to the comprehensive reading list at http://lasu.salford.ac.uk