Dependable Software Systems - European MSc

Programme Requirements

European MSc Dependable Software Systems (collaborative) - European MSc
CS5001 (15 credits) **and** CS5899 (45 credits) **and** Between 15 and 30 credits from Module List: CS5010, CS5030 and Between 0 and 30 credits from Module List: CS4052, CS4402 and Between 0 and 45 credits from Module List: IS5101 - IS5150, CS5003 - CS5089, ID5059 and **Further requirements** Choose 120 credits in academic year CS5001 is compulsory unless an equivalent module has been taken at a partner institution as part of the DESEM programme. Between 30 and 45 credits must be taken from the Module Lists. **Please balance your choices across the academic year.**

Compulsory modules:

CS5001 Object-Oriented Modelling, Design and Programming				
SCOTCAT Credits:	15	SCQF Level 11	**Semester:**	1
Planned timetable:	Variable			
This module introduces and revises object-oriented modelling, design and implementation up to the level required to complete programming assignments within other MSc modules. Students complete a number of practical exercises in laboratory sessions.				
Programme module type:	Compulsory for Advanced Computer Science, Artificial Intelligence, Computer Communication Systems and Software Engineering Postgraduate Programmes, except when exempted following satisfactory performance in an assessment conducted by the school. Compulsory for European Masters in Dependable Software Systems Postgraduate Programme Either CS5001 or CS5002 is compulsory for Human Computer Interaction and Computing and Information Technology Postgraduate Programmes. Optional for Data-Intensive Analysis, Information Technology and Management and Information Technology Postgraduate Programmes.			
Anti-requisite(s):	CS5002			
Required for:	CS5011, CS5022, CS5031, CS5052			
Learning and teaching methods and delivery:	**Weekly contact**: Lectures, tutorials and practical classes.			
Assessment pattern:	Coursework = 100%			
Module coordinator:	dopgt-cs@st-andrews.ac.uk			

CS5899 Erasmus Mundus Dissertation in Dependable Software Systems

SCOTCAT Credits:	45	SCQF Level 11	**Semester:**	Whole Year
Academic year:	2015/6 & 2016/7			
Availability restrictions:	Available only to students on Erasmus Mundus MSc in Dependable Software Systems.			
Planned timetable:	To be arranged.			
This module is an individually supervised dissertation, not exceeding 15,000 words, on a topic in computer science. Typically it comprises a literature review, extension of old or development of new ideas, their implementation and testing, summarised in a report, with the implementation based on sound theory and software engineering principles. Students will be required to give an assessed presentation of their work.				
Programme module type:	Compulsory for Erasmus Mundus in Dependable Software Systems MSc Postgraduate Programme at St Andrews.			
Learning and teaching methods and delivery:	**Weekly contact**: Meeting with supervisor.			
Assessment pattern:	Coursework = 100%			
Module Co-ordinator:	masters-coord-cs@st-andrews.ac.uk			

CS5899 Dissertation in Dependable Software Systems

SCOTCAT Credits:	45	SCQF Level 11	**Semester:**	Whole Year
Availability restrictions:	Available only to students on European Masters in Dependable Software Systems.			
Planned timetable:	To be arranged.			
This module is an individually supervised dissertation, not exceeding 15,000 words, on a topic in computer science. Typically it comprises a literature review, extension of old or development of new ideas, their implementation and testing, summarised in a report, with the implementation based on sound theory and software engineering principles. Students will be required to give an assessed presentation of their work.				
Programme module type:	Compulsory for European Masters in Dependable Software Systems Postgraduate Programme at St Andrews.			
Learning and teaching methods and delivery:	**Weekly contact**: Meeting with supervisor.			
Assessment pattern:	Coursework = 100%			
Module coordinator:	dopgt-cs@st-andrews.ac.uk			

One or two from:

CS5010 Artificial Intelligence Principles

SCOTCAT Credits:	15	SCQF Level 11	**Semester:**	1
Planned timetable:	To be arranged.			
This module covers foundational knowledge of Artificial Intelligence (AI). The module gives an overview of AI and its philosophy. It covers fundamental principles in AI: logical reasoning, reasoning in the presence of uncertainty, and machine learning. It shows how search is used to solve a variety of problems in AI. Notions such as agency and uncertainty in AI are covered. Finally, the philosophy of AI in practice and the philosophical problems in AI are shown.				
Programme module type:	Compulsory for Artificial Intelligence Postgraduate Programme. Optional for all Postgraduate Programmes in the School of Computer Science.			
Anti-requisite(s):	CS3105		**Required for:**	CS5011
Learning and teaching methods and delivery:	**Weekly contact**: Lectures, seminars, tutorials and practical classes.			
Assessment pattern:	2-hour Written Examination = 60%, Coursework = 40%			
Module coordinator:	dopgt-cs@st-andrews.ac.uk			

CS5030 Software Engineering Principles

SCOTCAT Credits:	15	SCQF Level 11	**Semester:**	1
Planned timetable:	To be arranged.			
This module examines the key concepts in small and large-scale software development. Project management is explored, along with the processes involved in developing system requirements, functionality and high-level descriptions necessary to guide the development of, and assess, a working system.				
Programme module type:	Compulsory for Software Engineering Postgraduate Programme. Optional for other Postgraduate Programmes.			
Learning and teaching methods and delivery:	**Weekly contact**: Lectures, seminars, tutorials and practical classes.			
Assessment pattern:	2-hour Written Examination = 60%, Coursework = 40%			
Module coordinator:	dopgt-cs@st-andrews.ac.uk			

CS5021 Advanced Networks

SCOTCAT Credits:	15	SCQF Level 11	**Semester:**	1
Planned timetable:	To be arranged.			
This module looks forward to new concepts and topics in networking, and also reviews key abstractions including layered models, protocols and Internet architecture, and key concerns such as reliability, resource utilization and quality of service. Specific networking technologies are used to demonstrate monitoring, measurement and analysis of real traffic.				
Programme module type:	Compulsory for Networks and Distributed Systems Postgraduate Programme. Optional for other Postgraduate Programmes.			
Pre-requisite(s):	-		**Anti-requisite(s):**	CS3102
Co-requisite(s):	CS5001		**Required for:**	CS5023, CS5029

One or both (depending on experience):

CS4052 Logic and Software Verification				
SCOTCAT Credits:	15	SCQF Level 10	**Semester:**	1
Planned timetable:	To be arranged.			
Building on earlier coverage of elementary logic, this module motivates the need for formal methods and software verification approaches as model checking for guaranteeing the correctness of software systems. The module covers modelling, system property specification using temporal logics, and more applied approaches to software specification and verification through the use of model checkers. Model checkers such as SPIN and UPPAAL are used both in lectures and in practical work. Petri nets and program semantics are also explored. Software correctness is thus presented as a matter not of testing but of pre-execution verification through model checking.				
Programme module type:	Optional for Dependable Software Systems Postgraduate Programme			
Learning and teaching methods and delivery:	**Weekly contact**: 2 lectures (x 10 weeks) and fortnightly tutorial.			
Assessment pattern:	2-hour Written Examination = 60%, Coursework = 40%			
Module coordinator:	hons-coord-cs@st-andrews.ac.uk			

CS4402 Constraint Programming				
SCOTCAT Credits:	15	SCQF Level 10	**Semester:**	2
Planned timetable:	To be arranged.			
This module introduces constraint-based reasoning as a powerful mechanism for knowledge representation and inference. It provides a thorough grounding in the constraint satisfaction/constrained optimisation problem formalism, and covers both basic techniques for implementing constraint solvers and the use of advanced techniques with a modern solver.				
Programme module type:	Either CS5012 or CS4402 is compulsory for the Artificial Intelligence Postgraduate Programme. Optional for Erasmus Mundus Dependable Software Systems Postgraduate Programme and other Postgraduate Programmes in the School			
Learning and teaching methods and delivery:	**Weekly contact**: 2 lectures (x 11 weeks) and fortnightly tutorial.			
Assessment pattern:	2-hour Written Examination = 60%, Coursework = 40%			
Module coordinator:	hons-coord-cs@st-andrews.ac.uk			

Optional modules:

CS5003 Masters Programming Projects				
SCOTCAT Credits:	15	SCQF Level 11	**Semester:**	2
Planned timetable:	Variable			
This module reinforces key programming skills gained in CS5002, by means of a series of coursework assignments posed as small programming projects. These are designed to offer increasing depth and scope for creativity as the module progresses.				
Programme module type:	Compulsory for Computing and Information Technology Postgraduate Programme. Optional for Advanced Computer Science, Artificial Intelligence, Computer Communication Systems, Intensive Analysis, Information Technology, Human Computer Interaction MSc Programmes, EngD in Computer Science			
Pre-requisite(s):	CS5002		**Anti-requisite(s):**	IS5108
Learning and teaching methods and delivery:	**Weekly contact**: Lectures, tutorials and practical classes.			
Assessment pattern:	Coursework = 100%			
Module coordinator:	dopgt-cs@st-andrews.ac.uk			

Further optional modules are available - see the pdf online called Computer Science - optional modules 2017/8.