

Module Specification

CSCK501 – Global Trends in Computer Science

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1. Module Details

Module Title:	Global Trends in Computer Science
Short Title:	Global Trends in Computer Science
Module Code:	CSCK501
Marketing Module Synopsis:	This is the first module for all online programmes in computer science. It covers both established and emerging themes in the domain of computer science, and introduces cutting edge research questions from the discipline. It's designed to provide students with a critical understanding of topics such as software engineering, enterprise systems, data protection and big data analytics, cyber security, pervasive computing, sustainable technology and risk management. Students completing the module will have a comprehensive global view of the current IT landscape in the context of both commercial and non-commercial enterprises. The module blends both theory and practice so that a solid foundation is provided for further study.
Credits:	15

Level:	Level 7
Delivery Location(s)	Online
Semester:	Whole Session
Academic Year:	2021-22
Faculty:	Faculty of Science and Engineering
School/Institute (Level 2):	School of Electrical Engineering, Electronics and Computer Science
Curriculum Board (level 1):	Computer Science PGT
Module Coordinator:	Frans Coenen
Other staff:	Helen Mattocks, Frans Coenen
External Examiner(s):	Neil Gordon, Dan Neagu
Pre-requisites:	N/A
Co-requisites:	N/A
Barred Combinations:	N/A
CE/CPD Provision:	No
Overview:	This is the first module for the online MSc programmes in computer science offered in partnership with Kaplan Open Learning. It is a required first module for all programmes. It has been designed to be broad enough to support both generalist MSc programmes while at the same time featuring in-depth aspects for specialist MSc programmes. The module spans eight weeks. The eight weeks cover a range of trending topics in computer science. The module allows students to

	obtain a critical understanding of these cutting-edge topics while at the same time allowing them to become familiar with the online learning environment and the nature of the assessment regime, and to acquire an appreciation of the expectations for subsequent modules.
Notes:	21/22 Modification is minor and needs no further scrutiny.20/21 Online first module provided in collaboration with Kaplan Open Learning.
Maximum Places:	250
HESA Cost Centre(s):	MUST BE COMPLETED FOR APPROVAL
Status:	Approved

HECoS Subject	Proportion (%)
	100 %

The table below is automatically completed from programme data held in Curriculum Manager; during 2019/20 it is likely to have no data or incomplete data until all programme records are in Curriculum Manager.

In Programmes:	Programme Validation Status	Module Status:	Programme Stage / Group / / Sub-group
Information Systems Management MSc 2021-22	Validated	Mandatory	Online Flexible Learning Y1 Online Flexible Learning Y1 Mandatory module 1 (onboarding)
Computer Science MSc 2021-22	Validated	Mandatory	Online Flexible Learning Y1

In Programmes:	Programme Validation Status	Module Status:	Programme Stage / Group / / Sub-group
			Online Flexible Learning Y1 Mandatory Module 1
Big Data Analytics MSc 2021-22	Validated	Required	Online Flexible Learning Y1 Online Flexible Learning Y1 Mandatory module 1 (onboarding)
Data Science and Artificial Intelligence MSc 2021-22	Validated	Required	Online Flexible Learning Y1 Online Flexible Learning Y1 Required Module 1
Artificial Intelligence MSc 2021-22	Validated	Required	Online Flexible Learning Y1 Online Flexible Learning Y1 Required Module 1
Cyber Security MSc 2021-22	Validated	Required	Online Flexible Learning Y1 Online Flexible Learning Y1 Required module 1 (onboarding)

The table below must be completed for module approval, including confirmation that there are zero costs to the student.

Student Cost(s)					
				Costs range:	
Cost Type:	Description:	Value type (exact, approximate or max/min range):	Cost (exact or approximate):	Minimum Cost:	Maximum Cost:
Student Cost	Over the 8-week module period, an estimated average cost of £12.50 per week for internet access and contribution to the cost of a personal computer (global variations may apply).	Approximate	100.00		

2. Aims and Content

Educational Aims:
<ul style="list-style-type: none"> • To familiarise students with the online classroom environment and allow them to explore current practice in computer science and information technology by sharing their global perspectives and experiences in discussion forums. • To provide a comprehensive and holistic introduction to current trends in computer science, such as enterprise systems management, data protection and big data analytics, cyber security, pervasive computing, sustainable technology and risk management. • To highlight the global, integrative and collaborative nature of the information technology industry, whilst allowing students to explore the relevance and impact of their unique regional contexts through critical discussion and group work. • To allow students to explore and critically debate the use of information technology in an enterprise setting, the best way to make decisions regarding technology, and the management and administration needs of an organisation.

Outline Syllabus:
<p>Week 1: Trends in Computer Science</p> <p>High-level overview of emerging trends such as blockchains, pervasive computing and artificial intelligence, and their importance in a global context. Ethical, privacy and legal considerations around these topics. Opportunities offered by innovation.</p> <p>Week 2: Information Technology</p> <p>Managing information technology. Budgeting and technology portfolio management. Outsourcing. Vendor and contact management. Strategic management of technology, roadmaps and tactical planning to meet business goals when developing systems.</p> <p>Week 3: Risk Management</p> <p>Using information technology for risk management and decision making. Appreciating and working with diverse viewpoints. Privacy, compliance and regulation in the global technology enterprise.</p> <p>Week 4: Cyber security</p> <p>Designing and managing enterprise systems with security in mind. Penetration testing. Ethical hacking tools and techniques. Password security and encryption.</p> <p>Social engineering.</p> <p>Week 5: Green computing.</p> <p>Production of more efficient software and hardware, and the impact of a growing cloud-based infrastructure on power</p>

consumption. The sustainable development of data centres in a globally connected world. Week 6: Internet of things and smart cities. Connected embedded devices, sensors and the data they produce. Opportunities for driving societal change via data analysis from pervasive sensor technology. Security and privacy implications of such systems. Week 7: Big data analytics. Tools and techniques for extracting, processing, analysing and visualising data from a variety of sources. Data warehousing and data management within a global context, including data privacy and data protection regulations. Week 8: Real-time, high integrity and embedded systems. Standards and principles for the development and management of real-time, high integrity and embedded systems. Related safety, security, trust and privacy issues. High performance computing and distributed supercomputer architectures.

Reading lists and resources:

Type	Category	Title	Description
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3. Module Outcomes (learning outcomes, skills and other attributes)

Ref No.	Learning Outcome / Skill:	Category:
M1	Contribute to an academic community via the use of an online classroom and discussion forum, whilst demonstrating a commitment to lifelong learning, academic integrity and an understanding of the academic writing style.	Learning Outcomes: Master's
M2	Produce an artefact that involves searching for, assimilating and analysing relevant scholarly resources, reflecting a range of viewpoints with original thought and commentary, and demonstrating digital fluency with search tools and presentation software.	Learning Outcomes: Master's
M3	Demonstrate a critical understanding of current trends in computer science, and an appreciation of how information technology can be used to support business processes and add value to global enterprises.	Learning Outcomes: Master's
M4	Articulate the legal, social, ethical and professional issues related to developing and using information systems and modern technology solutions, demonstrate professionalism, and follow relevant professional codes of practice.	Learning Outcomes: Master's
S1	Ability to organise self and workloads.	Skills
S2	Ability to communicate with others in an online environment.	Skills
S3	Ability to use information technology (digital fluency).	Skills

Ref No.	Learning Outcome / Skill:	Category:
S4	Ability to use online library resources and conduct relevant searches for literature.	Skills
S5	Ability to learn effectively in an online classroom (lifelong learning).	Skills

4. Assessments

Assessment Strategy:
The module features two broad categories of assessment: discussion questions and practical assessments. The first has a focus on moderated active learning, where the faculty member responsible for the module posts discussion questions to which students respond individually and then consider each other's responses. Each discussion question runs over a three-week period. At the end of the first week each student posts a 500 word "initial response". During the second week each student selects two or three responses, made by other students in the first week, and writes a 500 word "follow-up" response. In the third week each student reviews the initial and follow-up responses from the previous two weeks and submits a 500 word executive critical summary with respect to the main themes identified by the responses. Practical assessment adopts the principle of authentic assessment where the assessment tasks to be undertaken are aligned with the kinds of task that students would be expected to undertake in a professional setting. 1. Due to nature of the on-line mode of instruction work is not marked anonymously. 2. Reassessment opportunities offered in line with Code of Practice on Assessment. 3. Penalties for late submission will be in line with Code of Practice on Assessment.

All fields in the table below must be completed for module approval.

Method	Description	Type	Units of Length	Length	Min	Max	Description (re length)	Weighting	Assessment period(s)	Group Work	Must Pass	Final Assessment
Presentation	Group Presentation: Group work resulting in a joint poster and video presentation that reviews one of the topics from the module	Summative	Hours	12	N/A	N/A	N/A	30 %	Wk05	Yes	No	No

Method	Description	Type	Units of Length	Length	Min	Max	Description (re length)	Weighting	Assessment period(s)	Group Work	Must Pass	Final Assessment
	and demonstrates digital fluency.											
Coursework	Essay: An individual essay directed at one of the trending topics in computer science covered within the module.	Summative	Words	N/A	2000	2500	N/A	30 %	Wk08	No	No	Yes
Coursework	Discussion Question 2: Participate actively in an online discussion concerning one of the topics covered within the module, demonstrating an understanding of the key issues and showing original thought.	Summative	Words	N/A	1000	1500	N/A	20 %	Wk07	No	No	No
Coursework	Discussion Question 1: Participate actively in an online discussion concerning one of the topics covered within the module, demonstrating an understanding of the	Summative	Words	N/A	1000	1500	N/A	20 %	Wk03	No	No	No

Method	Description	Type	Units of Length	Length	Min	Max	Description (re length)	Weighting	Assessment period(s)	Group Work	Must Pass	Final Assessment
	key issues and showing original thought.											

Please see Appendix 1 for details of the outcomes tested by the above assessments.

Module Specification Appendix 1: Assessments and the Outcomes Tested

Module Title	Global Trends in Computer Science
Module Code	CSCK501

In the table below, all fields should be completed for approval, except for the Weighting field for a **Formative Type** assessment method.

Assessment Method	Type	Pass / Fail	Weighting	Marked out of	Pass Mark	Learning Outcomes / Skills Tested
Presentation	Summative	No	30 %	100	50	M2, M3, M4, S2, S3
Coursework	Summative	No	30 %	100	50	M3, M4, S3, S4
Coursework	Summative	No	20 %	100	50	M1, M3, M4, S2
Coursework	Summative	No	20 %	100	50	M1, M3, M4, S2

5. Learning and Teaching Methods

Summary of Learning and Teaching Methods:

The mode of delivery is by online learning, facilitated by a Virtual Learning Environment (VLE). This mode of study enables students to pursue modules via home study while continuing in employment. Module delivery involves the establishment of a virtual classroom in which a relatively small group of students (usually 10-25) work under the direction of a faculty member. Module delivery proceeds via a series of eight one-week online sessions, each of which comprises an online lecture, supported by other eLearning activities, posted electronically to a public folder in the virtual classroom. The mode of learning includes a range of required and optional eLearning activities, including but not limited to: lecture casts, live seminars, self-assessment opportunities, and required and suggested further reading and try-for-yourself activities. Communication within the virtual classroom is asynchronous, preserving the requirement that students are able to pursue the module in their own time, within the weekly time-frame of each online session. An important element of the module provision is active learning through collaborative, cohort-based, learning using discussion fora where the students engage in assessed discussions facilitated by the faculty member responsible for the module. This in turn encourages both confidence and global citizenship (given the international nature of the online student body).

The following table must be completed for module approval, accounting for all hours associated with the credit value of the module, e.g. for 15 credits there should be 150 hours of learning and teaching activity, including independent learning.

Learning and Teaching Method:	Length (Minutes):	Times per Week (if applicable):	Number of Weeks (if applicable):	Calculated Hours (if applicable):	Hours:
Self-Directed Learning	N/A	N/A	N/A	N/A	40
Assignment	N/A	N/A	N/A	N/A	50
Online Classroom	N/A	N/A	N/A	N/A	30
Online Discussions	N/A	N/A	N/A	N/A	30

6. Supplementary Information

If a risk assessment is required for this module for students under 18, please record a summary of the risks:	N/A
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