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## Type 1 Accreditation Visit Report

<b>Higher Education Institution</b>	<b>Visit Information</b>
University of East Anglia School of Computing Sciences Norwich NR4 7TJ	<b>Date of Visit</b> Wednesday 18 November 2015 <b>Panel Chair</b> Dr H Powell <b>Panel Members</b> Eur Ing Mr R Neil Professor R Earnshaw Dr W Ivins <b>BCS Secretariat</b> Mrs S Pearce

<b>Head of School</b>	Professor Vincent Moulton
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A1	<b>Panel Recommendations</b>
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Recommendations for Accreditation at Visit			
Programme Title	Recommended Level of Accreditation	Modes	Intakes
<i>Unconditional</i>			
BSc (Hons) Computing Science / with a Year in Industry	CITP and CEng (partial fulfilment)	3FT/4SW	2016-2020 Bkdt 2015

Recommendations for Accreditation after consideration of 90-Day Response			
Programme Title	Recommended Level of Accreditation	Modes	Intakes
<i>Unconditional</i>			
MComp Computing Science		4FT	
BSc (Hons) Computer Graphics, Imaging and Multimedia		3FT	
BEng (Hons) Computer Systems Engineering / with a Year in Industry		3FT/4SW	
BSc (Hons) Business Information Systems / with a Year in Industry		3FT/4SW	
MSc Advanced Computing Science		1FT/2PT	
MSc Information Systems		1FT/2PT	
MSc Knowledge Discovery and Data Mining		1FT/2PT	
<i>Conditional</i>			
MComp Computing Science with a Year Abroad		FT	
<i>Condition: Students must take an individual project at the host institution worth at least 30 credits and this must be evidenced in the results transcript.</i>			

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### Not Considered for Accreditation – Included for Discussion

#### MSc Computing Science

The Panel noted that the School also had a generalist MSc Computing Science programme which had not been included in the visit submission. The School is invited to provide a documentary submission in its own time, to include criteria mapping, core/option table, programme specification, module specifications, external examiners' reports together with responses, assessments/examination papers and a sample of projects with mark sheets.

### Withdrawn by the School before the visit

#### MSc Games Development

The School withdrew the MSc Games Development programme which has been discontinued with effect from the 2015 intake.

### Withdrawn by the School at the visit

#### BSc (Hons) Computing Science with a Year Abroad

The School withdrew the BSc (Hons) Computing Science with a Year Abroad programme as it had not recruited for the 2015 intake and will be discontinued.

### Commendations

The Panel commended the School in the following areas:

- The extensive input to programmes from external speakers.
- The staff availability and support for students.
- The extent of research input into the programmes and involvement with industrial clients.

*All items are Above Threshold unless noted. Further details can be found in Appendix 3.*

A2

### 90 Day Response Recommendations

For the *BSc (Hons) Computer Graphics, Imaging and Multimedia* and *BSc (Eng) Computer Systems Engineering* programmes, coverage and assessment of 'knowledge and understanding of management techniques' (*criterion 2.1.8*) is reliant on the project module and whilst the Panel was happy with the reported practice, there was no emphasis on this in the project module specification.

The Panel was unable to find explicit evidence of where 'knowledge and understanding of mathematical and/or statistical principles' (*criterion 3.1.4*) is being taught and assessed within the *BSc (Hons) Business Information Systems* programme.

The sample projects submitted for the *BSc (Hons) Business Information Systems* programme included survey type projects which did not 'meet the requirements set out in section 2.5 of the guidelines' (*criterion 11.1.2*) and the Panel invited the School to consider a mechanism to ensure that all projects meet the requirements or that those that do not are clearly identifiable.

The Panel noted that the previous visiting Panel had judged 'written guidance on all aspects of the project' (*criterion 11.1.1*) to be at threshold for the MComp project as the guidance included less detail than would be expected and recommended that this should be strengthened. The Panel was surprised to find that guidance still appeared light and that more detailed written guidance for the MComp project was required.

The Panel was unable to find evidence within the documentation or through discussions with the course team that 'legal, social, ethical and professional issues' (*criteria 8.1.3 and 9.1.3*) are being assessed in the postgraduate programmes.

The Panel could not find evidence of where students have the opportunity 'to work as a member of a development team' (*criterion 7.1.9*) in the Masters programmes.

Therefore, the Panel requires a ninety day response within which time the School must provide the following:

#### **BSc (Hons) Computer Graphics, Imaging and Multimedia and BSc (Eng) Computer Systems Engineering**

- An updated project module specification showing explicit emphasis on teaching and assessment of management techniques.

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**BSc (Hons) Business Information Systems**

- Explicit evidence of teaching and assessment of mathematical and/or statistical principles.
- Evidence of a mechanism to ensure that projects meet the BCS criteria or identification of those that do not.

**MComp Computing Science and MComp Computing Science with a Year Abroad**

- Detailed written project guidance.

**MSc Advanced Computing Science, MSc Information Systems and MSc Knowledge Discovery and Data Mining**

- Evidence of the assessment of legal, social, ethical and professional issues.
- Evidence of where students work as a member of development team.

Upon receipt of a satisfactory submission within ninety days, the Panel will recommend accreditation as detailed below:

Programme Title	90 Day Response Recommendations	Modes	Intakes
<i>Unconditional</i>			
<b>MComp Computing Science</b>	<b>CITP, CITP Further Learning and Full CEng</b>	<b>4FT</b>	<b>Not exceeding five</b>
<b>BSc (Hons) Computer Graphics, Imaging and Multimedia</b>	<b>CITP and CEng (partial fulfilment)</b>	<b>3FT</b>	
<b>BEng (Hons) Computer Systems Engineering / with a Year in Industry</b>	<b>CITP and CEng (partial fulfilment)</b>	<b>3FT/4SW</b>	
<b>BSc (Hons) Business Information Systems / with a Year in Industry</b>	<b>CITP (partial fulfilment)</b>	<b>3FT/4SW</b>	
<b>MSc Advanced Computing Science</b>	<b>CITP Further Learning and CEng (partial fulfilment)</b>	<b>1FT/2PT</b>	
<b>MSc Information Systems</b>	<b>CITP Further Learning and CEng (partial fulfilment)</b>	<b>1FT/2PT</b>	
<b>MSc Knowledge Discovery and Data Mining</b>	<b>CITP Further Learning and CEng (partial fulfilment)</b>	<b>1FT/2PT</b>	
<i>Conditional</i>			
<b>MComp Computing Science with a Year Abroad</b>	<b>CITP, CITP Further Learning and Full CEng</b>	<b>FT</b>	<b>Not exceeding five</b>
<i>Condition: Students must take an individual project at the host institution worth at least 30 credits and this must be evidenced in the results transcript.</i>			

The above submission must be with BCS within ninety days of receiving this. The Committee will then consider its recommendation.

The Panel was surprised that the School was not seeking CSci accreditation for the Integrated Masters programmes and felt that from the information available, accreditation looked possible. It is recommended that the School contact the BCS should they wish to pursue this.

A3	Development Plan
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**Below Threshold (improvements must be made in order to meet the accreditation criteria)**

1. For the *BSc (Hons) Computer Graphics, Imaging and Multimedia* and *BSc (Eng) Computer Systems Engineering* programmes, coverage and assessment of 'knowledge and understanding of management techniques' (*criterion 2.1.8*) is reliant on the project module and whilst the Panel was happy with the reported practice, there was no emphasis on this in the project module specification.
2. The Panel was unable to find explicit evidence of where 'knowledge and understanding of mathematical and/or statistical principles' (*criterion 3.1.4*) is being taught and assessed within the *BSc (Hons) Business Information Systems* programme.
3. The Panel was unable to find evidence within the documentation or through discussions with the course team that 'legal, social, ethical and professional issues' (*criteria 8.1.3 and 9.1.3*) are being assessed in the postgraduate programmes.
4. The Panel could not find evidence of where students have the opportunity 'to work as a member of a development team' (*criterion 7.1.9*) in the Masters programmes.
5. The Panel noted that the previous visiting Panel had judged 'written guidance on all aspects of the project' (*criterion 11.1.1*) to be at threshold for the MComp project as the guidance included less detail than would be expected and recommended that this should be strengthened. The Panel was surprised to find that guidance still appeared light and that more detailed written guidance for the MComp project was required.
6. The sample projects submitted for the *BSc (Hons) Business Information Systems* programme included survey type projects which did not 'meet the requirements set out in section 2.5 of the guidelines' (*criterion 11.1.2*) and the Panel invited the School to consider a mechanism to ensure that all projects meet the requirements or that those that do not are clearly identifiable.

**At Threshold (the next Panel will check that the School has made improvements)**

7. The Panel noted that the School's processes for assessing the content of the Year Abroad would benefit from a more systematic approach.
8. The Panel was satisfied that the core modules had been mapped to the BCS criteria but through discussions with the course team, it was evident that there were instances where other modules also met the criteria but had not been mapped.
9. The Panel was reassured through its discussion with the course team that 'legal, social, ethical and professional issues' (*criterion 2.1.6*) is being taught and assessed within the undergraduate programmes but this practice would benefit from clearer explicit description in the module specifications. In addition, the Panel encouraged the development of more explicit assessment of these issues (*criteria 8.1.3 and 9.1.3*) in the final year of the *MComp Computing Science / with a Year Abroad* programmes.
10. The Panel was satisfied with the coverage and assessment of 'knowledge and understanding of information security issues' (*criterion 2.1.9*) and 'knowledge and understanding of methods, techniques and tools for information modelling, management and security' (*criterion 3.1.2*) and encouraged enhancement of these aspects particularly in the *BSc (Hons) Computer Graphics, Imaging and Multimedia* and *BSc (Hons) Business Information Systems* programmes.
11. The Panel was satisfied that the supplementary requirements at Integrated masters level (*criterion 5.1*) were met by the MComp group project with the exception of 'critical self-evaluation of the process' which was covered at threshold level by CMPSMC31 Advanced Programming Concepts and Techniques. The Panel encouraged the School to explore options to strengthen this by inclusion in the major group project.
12. For the MComp programmes, the Panel encouraged further development in the area of 'undertake risk management associated with a range of activities' (*criterion 7.1.5*).

**Following the 90 Day Response**

(to be completed following submission)

**Section B - Department Overview**

<b>Name of School</b>	Computing Sciences
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This was the eighth full visit to the University; the previous visits took place in 1987, 1989, 1992, 1997, 2002, 2006 and 2009. The visit in 2006 was a small scale visit to review issues raised at the 2002 visit. The planned visit in 2014 was postponed by the School due to a planned major overhaul of programmes. The School of Computing Sciences is one of six schools of study in the Faculty of Science, alongside the Schools of Biological Sciences, Chemistry, Computing, Environmental Sciences, Mathematics and Pharmacy.

A list of programmes put forward for accreditation is included as Appendix 1.

*All items are Above Threshold unless noted*

<b>B1</b>	<b>Quality Assurance</b>
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The School's Teaching Committee has oversight of matters related to teaching, developing School policy, reviewing proposed changes and monitoring practice. The University has a mandatory 5 year module review requirement and seven triggers to initiate a module review. In addition, the School has its own triggers to initiate a module review, including, for example, student feedback, a new module lecturer or poor coursework turnaround.

**At Threshold:** The Panel noted that the School's processes for assessing the content of the Year Abroad would benefit from a more systematic approach.

<b>B2</b>	<b>Research/Industrial Activity Informing Programmes</b>
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The School's research is organised within three laboratories: Graphics, Vision and Speech; Machine Learning and Statistics; and Computational Biology. The Science Faculty houses research facilities dedicated to virtual environments, speech, colour, mathematical modelling and algorithms and computational biology. The School runs an active research seminar series attracting speakers from around the world.

The University's Research and Enterprise department (REN) has three Relationship Managers to help academic staff build relationships with private, public and not-for-profit partners. Guest speakers appear on many modules and in the second year, ex-students now working in industry return to give talks on the Programming 2 module. Many students work with industry to carry out their final year project or master's dissertation.

The Panel commended the extent of research input into the programmes and the School's involvement with industrial clients.

<b>B3</b>	<b>Staffing: Academic and Support</b>
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<i>CITP</i>	1	<i>MBCS</i>	4	<i>FBCS</i>	0
<i>CEng</i>	1	<i>IEng</i>	-	<i>CSci</i>	0

**Academic Staff**

The School has a staff student ratio of 1:16.1 based on a full-time equivalent academic staff of 24.4.

**Support Staff**

There are 18 support staff, which includes 1 hardware support and 3 software support staff and this was seen as sufficient by the Panel.

B4

**Resources Computing Facilities including Hardware and Software and Library**

**Computing:** The ratio of students per laboratory computer is 3.49:1. CMP machines are arranged into seven laboratories containing 16-22 machines in each and are for the sole use of CMP students. The MSc Lab is available 24/7 whilst other labs are open weekdays from 08.30 to 17.00 but also open during evenings and weekends at times of high coursework loads. There are also 550 computers supported by the University's IT and Computing Service (ITCS) and are available for general access. The library also has 164 computers available 24/7 and a further 150 machines are available in the Arts building from 07.00-21.00. The School is covered by a wireless network. Students are provided with almost all available Microsoft software via licensing agreements. The School has an annual £5k budget to cover specialist software. Labs are updated on a 4-year rolling cycle and £15-£20k is spent each year on updating student hardware. The School encourages the use of personal computers by providing wireless coverage throughout the University and advice can be sought from CMP Support or ITCS Help Desk.

**Library:** The Library is accessible 24 hours a day 365 days a year and has a number of electronic subscriptions. The Computing Sciences budget varies annually, for 2013/14, £98.5k was spent on journals and £15.1k was spent on books.

B5

**Student Experience**

The Panel met with a range of undergraduate and postgraduate students from a range of programmes. The students valued their learning environment and the resources available to them and were highly appreciative of the availability of and support from staff. The students commented on the timeliness of feedback on work submitted through the Hub and the Panel noted that submission of all work through the Hub was a University directive and that the Hub is a central facility supporting all Schools. It was felt that whilst the feedback time was by no means slow, it was not generally liked by students who would prefer a more local, less anonymous and more immediate service.

## Section C - Programmes Reviewed

C1	<b>Programme Structure Details</b>
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### Undergraduate and Integrated Masters:

All taught modules are worth 20 credits. At Level 4, all of the Computing programmes share a common first year consisting of five compulsory modules and one optional mathematics module from a choice of two. Level 4 of the first year of the Business programme consists of compulsory modules, including four computing modules and two business modules. At Level 5, the computing programmes include between three and five compulsory modules with the remaining credits being selected from restricted groups of options. Level 5 of the Business programme currently consists of two compulsory modules (one will move to L4 wef 2015) with the remaining modules being selected from options. The Year Abroad variant of the *BSc (Hons)/MComp Computing Science* includes 120 compulsory credits. At Level 6, the computing programmes take a compulsory 40 credit Computing Project with the remaining 80 credits of taught modules being selected from restricted groups of options. The Business programme has a compulsory 40 credit BIS Project and one compulsory taught module with the remaining 60 credits being selected from options.

The *MComp Computing Science* shares the first 3 years with the BSc (Hons) programme. The taught element at Level 7 consists of two compulsory modules and one being selected from options together with the MComp project which is worth 60 credits and is a team project.

The Year in Industry variant of the *BSc (Hons) Computing Science*, *BEng (Hons) Computer Systems Engineering* and *BSc (Hons) Business Information Systems* programmes include a 40 credit Industrial Project Report and an 80 credit Year in Industry module.

### Postgraduate:

The MSc programmes comprise 180 credits with a 60 credit Dissertation. The taught modules are all worth 20 credits. The *MSc Advanced Computing Science* and *MSc Information Systems* programmes consist of two compulsory taught modules with a 40/40 split of the remaining 80 credits being selected from two groups of options. The MSc Games Development programme also comprises two compulsory taught modules with the remaining 80 credits being selected from one group of options. The *MSc Knowledge Discovery and Data Mining* programme comprises four compulsory taught modules with the remaining 40 credits being selected from one group of options.

Programme structure details are attached as Appendix 2.

## Assessment of Criteria

*All items are 'Above Threshold' unless noted*

C2	<b>Aims Content and Underpinning</b>
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The Panel was satisfied that the aims, content and underpinning fell sufficiently within the Computing Benchmark.

**At Threshold:** The Panel was satisfied that the core modules had been mapped to the BCS criteria but through discussions with the course team, it was evident that there were instances where other modules also met the criteria but had not been mapped.

C3	<b>Cognitive Outcomes</b>
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The Panel generally found the cognitive outcomes to be at the appropriate level for the accreditation sought. The Panel noted good integrated coverage of Legal, Social, Ethical and Professional Issues across the undergraduate curriculum which was both taught and assessed.

**At Threshold:** The Panel was reassured through its discussion with the course team that 'legal, social, ethical and professional issues' (*criterion 2.1.6*) is being taught and assessed within the undergraduate programmes but this practice would benefit from clearer explicit description in the module specifications. In addition, the Panel encouraged the development of more explicit assessment of these issues (*criteria 8.1.3 and 9.1.3*) in the final year of the *MComp Computing Science / with a Year Abroad* programmes.

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**At Threshold:** The Panel was satisfied with the coverage and assessment of 'knowledge and understanding of information security issues' (*criterion 2.1.9*) and 'knowledge and understanding of methods, techniques and tools for information modelling, management and security' (*criterion 3.1.2*) and encouraged enhancement of these aspects particularly in the *BSc (Hons) Computer Graphics, Imaging and Multimedia* and *BSc (Hons) Business Information Systems* programmes.

**Below Threshold:** For the *BSc (Hons) Computer Graphics, Imaging and Multimedia* and *BSc (Eng) Computer Systems Engineering* programmes, coverage and assessment of 'knowledge and understanding of management techniques' (*criterion 2.1.8*) is reliant on the project module and whilst the Panel was happy with the reported practice, there was no emphasis on this in the project module specification.

**Below Threshold:** The Panel was unable to find explicit evidence of where 'knowledge and understanding of mathematical and/or statistical principles' (*criterion 3.1.4*) is being taught and assessed within the *BSc (Hons) Business Information Systems* programme.

**Below Threshold:** The Panel was unable to find evidence within the documentation or through discussions with the course team that 'legal, social, ethical and professional issues' (*criteria 8.1.3 and 9.1.3*) are being assessed in the postgraduate programmes.

C4	<b>Practical Outcomes</b>
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The Panel found the practical outcomes to be at the appropriate level for the accreditation sought.

C5	<b>Transferable Outcomes</b>
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The Panel found the transferable outcomes to be at the appropriate level for the accreditation sought.

**At Threshold:** The Panel was satisfied that the supplementary requirements at Integrated masters level (*criterion 5.1*) were met by the MComp group project with the exception of 'critical self-evaluation of the process' which was covered at threshold level by CMPSMC31 Advanced Programming Concepts and Techniques. The Panel encouraged the School to explore options to strengthen this by its inclusion in the major group project.

**At Threshold:** For the MComp programmes, the Panel encouraged further development in the area of 'undertake risk management associated with a range of activities' (*criterion 7.1.5*).

**Below Threshold:** The Panel could not find evidence of where students have the opportunity 'to work as a member of a development team' (*criterion 7.1.9*) in the Masters programmes.

C6	<b>Project</b>
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The School confirmed that projects cannot be passed with compensation; therefore no condition will be added to the recommendation for accreditation. The Panel could not be certain that students on the *MComp Computing Science with a Year Abroad* programme would undertake an appropriately sized individual project at Level 6 and therefore placed a condition on accreditation that students undertake a project worth at least 30 credits.

**Below Threshold:** The Panel noted that the previous visiting Panel had judged 'written guidance on all aspects of the project' (*criterion 11.1.1*) to be at threshold for the MComp project as the guidance included less detail than would be expected and recommended that this should be strengthened. The Panel was surprised to find that guidance still appeared light and that more detailed written guidance for the MComp project was required.

**Below Threshold:** The sample projects submitted for the *BSc (Hons) Business Information Systems* programme included survey type projects which did not 'meet the requirements set out in section 2.5 of the guidelines' (*criterion 11.1.2*) and the Panel invited the School to consider a mechanism to ensure that all projects meet the requirements or that those that do not are clearly identifiable.

C7	<b>Entry, Assessment and Graduation</b>
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Normal entry requirements at undergraduate level are AAB or 340 UCAS points for MComp programmes or ABB or 320 UCAS points for all other programmes. Programmes with a Year Abroad variant require A Level Mathematics or equivalent. In addition, all applicants require at least one A Level of equivalent, in Mathematics, Physics, Chemistry, Biology, Computing, Electronics or Economics.

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All postgraduate programmes require a good first degree or equivalent and experience. The *MSc Advanced Computing Science* and *MSc Games Development* programmes require the first degree to be in Computing Science or a cognate subject. In addition for the Games Development programme, some knowledge of Computer Graphics is desirable. The *MSc Knowledge Discovery and Data Mining* programme requires the first degree to be in computing, mathematics or a related subject. The *MSc Information Systems* requires a first degree with a substantial computing component and a basic knowledge of programming (Java) and database systems is assumed

Appendix 1 List of Programmes put forward for Accreditation

Programme Title:		Modes offered (eg SW, FT, PT, DL)	Length of programme	CITP	CITP Further Learning	CEng	CSci	IEng
<b>MComp Computing Science</b>		FT	4	✓	✓	✓		
<i>First Offered</i>	2007							
<i>Last Revision</i>	2014							
<i>Intakes</i>	2016-2020 Bkdt 2015							
<b>MComp Computing Science with a Year Abroad</b>		FT	4	✓	✓	✓		
<i>First Offered</i>	2007							
<i>Last Revision</i>	2014							
<i>Intakes</i>	2016-2020 Bkdt 2015							
<b>BSc (Hons) Computing Science / with a Year in Industry</b>		FT, SW	3,4	✓		✓		
<i>First Offered</i>	1993 / 2007							
<i>Last Revision</i>	2014							
<i>Intakes</i>	2016-2020 Bkdt 2015							
<b>BSc (Hons) Computing Science with a Year Abroad</b>		FT	3	✓		✓		
<i>First Offered</i>	2007							
<i>Last Revision</i>	2014							
<i>Intakes</i>	2016-2020 Bkdt 2015							
<b>BSc (Hons) Computer Graphics, Imaging and Multimedia (previously Computing Science, Imaging and Multimedia)</b>		FT	3	✓		✓		
<i>First Offered</i>	2015 (2001)							
<i>Last Revision</i>	2015							
<i>Intakes</i>	2016-2020 Bkdt 2015							
<b>BEng (Hons) Computer Systems Engineering / with a Year in Industry</b>		FT,SW	3,4	✓		✓		
<i>First Offered</i>	2010							
<i>Last Revision</i>	2015							
<i>Intakes</i>	2016-2020 Bkdt 2015							
<b>BSc (Hons) Business Information Systems / with a Year in Industry</b>		FT,SW	3,4	✓				
<i>First Offered</i>	1993 / 2015							
<i>Last Revision</i>	2015							
<i>Intakes</i>	2016-2020 Bkdt 2015							
<b>MSc Advanced Computing Science</b>		FT,PT	1,2		✓	✓		
<i>First Offered</i>	2001							
<i>Last Revision</i>	-							
<i>Intakes</i>	2016-2020 Bkdt 2015							

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Programme Title:		Modes offered (eg SW, FT, PT, DL)	Length of programme	CITP	CITP Further Learning	CEng	CSci	IEng
<b>MSc Information Systems</b>		FT,PT	1, 2		✓	✓		
<i>First Offered</i>	2000							
<i>Last Revision</i>	-							
<i>Intakes</i>	2016-2020 Bkdt 2015							
<b>MSc Knowledge Discovery and Data Mining</b>		FT, PT	1, 2 or 3		✓	✓		
<i>First Offered</i>	1998							
<i>Last Revision</i>	-							
<i>Intakes</i>	2016-2020 Bkdt 2015							



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Module Code	Module Name	Credits	CMP SCI	CMP SCI YI	CMP SCI YA	CMP GRA	CMP SYS	CMP SYS YI	BUS	BUS YI	MComp	Mcomp p YA
<b>Year in Industry</b>												
CMP-6014Y	Industrial Project Report	40		comp.				comp.		comp.		
CMP-6011Y	Year in Industry	80		comp.				comp.		comp.		

<b>Level 6</b>												
CMP-6013Y	Computing Project	40	comp.	comp.	comp.	comp.	comp.	comp.			comp.	comp.
CMP-6002A	Machine Learning	20	opt	opt	opt						opt	opt
CMP-6004A	Advanced Statistics	20	opt	opt	opt						opt	opt
CMP-6006A	Graphics 2	20	opt	opt	opt	opt 6A.4	opt	opt 6A.2			opt	opt
CMP-6008A	Information Retrieval	20	opt	opt	opt				opt	opt	opt	opt
CMP-6010A	Software Engineering 2	20	opt	opt	opt	opt 6B.4	opt	opt 6A.2	opt	opt	opt	opt
CMP-6026A	Audiovisual Processing	20	opt	opt	opt	opt 6A.4	opt	opt 6A.2			opt	opt
CMP-6003B	Systems Engineering	20	opt	opt	opt 6B.1				comp.	comp.	opt	opt 6B.1
CMP-6009B	Networks	20	opt	opt	opt 6B.1	opt 6A.4	opt 6B.2	opt 6B.2	opt	opt	opt	opt 6B.1
CMP-6024B	Embedded Systems	20	opt	opt	opt 6B.1	opt 6B.4	opt 6B.2	opt 6B.2			opt	opt 6B.1
CMP-6034B	Algorithms for Bioinformatics	20	opt	opt	opt 6B.1						opt	opt 6B.1
CMP-6035B	Computer Vision	20	opt	opt	opt 6B.1	opt 6A.4	opt 6B.2	opt 6B.2			opt	opt 6B.1
CMP-5003A	Systems Analysis	20	opt	opt	opt 6C.1						opt	opt 6C.1
CMP-5013A	Architectures and Operating Systems	20	opt	opt	opt 6C.1						opt	opt 6C.1
CMP-5027A	Analogue and Digital Electronics	20	opt	opt	opt 6C.1						opt	opt 6C.1
ENV-5006A	Mathematics for Scientists B	20	opt	opt	opt 6C.1						opt	opt 6C.1
LAW-6001A	Internet Law	20	opt	opt	opt 6C.1				opt	opt	opt	opt 6C.1
CMP-5050B	Graphics 1	20	opt	opt	opt 6D.1						opt	opt 6D.1
CMP-5017B	Applied Statistics A	20	opt	opt	opt 6D.1						opt	opt 6D.1
ENG-6001B	Electricity Generation and Distribution	20	opt	opt	opt 6D.1						opt	opt 6D.1
ENV-5007B	Mathematics for scientists C	20	opt	opt	opt 6D.1						opt	opt 6D.1
CMP-6012Y	Business Information Systems Project	40							comp.	comp.		
NBS-6024Y	Organisational Information Systems	20							comp.	comp.		
	6 film and television modules	30 each				opt 6B.4						
	23 Business Modules	20 each							opt	opt		

Module Code	Module Name	Credits	CMP SCI	CMP SCI YI	CMP SCI YA	CMP GRA	CMP SYS	CMP SYS YI	BUS	BUS YI	MComp	Mcomp p YA
<b>Level 7</b>												
CMPSMA7Y	Mcomp Project	60									comp.	comp.
CMPSMC31	Advanced Programming Concepts and Techniques	20									comp.	comp.
CMPSMC34	Distributed Computing	20									comp.	comp.
CMPSMA27	Artificial Intelligence	20									opt 7A.1	opt 7A.1
CMPSMC24	Data Mining	20									opt 7A.1	opt 7A.1
CMPSME22	Computer Games Laboratory	20									opt 7A.1	opt 7A.1
CMPSMM23	Human Computer Interaction	20									opt 7A.1	opt 7A.1

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Postgraduate programmes						
<b>Key:</b>						
		MSc Advanced Computing Science	ACS			
		MSc Games Development	GD			
		MSc Information Systems	IS			
		MSc Knowledge Discovery and Data Mining	KDD			
	comp.	Compulsory				
	A, B	Students must take two modules marked A and two modules marked B. Where modules are marked A/B the module appears in both option ranges.				
	C	Students must take 4 modules from modules marked C				
	Note:	KDD students without database experience MUST take CMPSMB11 and students without programming experience MUST take CMPSMA23.				
Module Code	Module Name	Credits	ACS	GD	IS	KDD
<b>Level 7</b>						
CMPSMP6X	Dissertation	60	comp.	comp.	comp.	comp.
CMPSMP2Y	Research Techniques	20	comp.	comp.	comp.	comp.
CMPSME22	Computer Games Laboratory	20	A/B	comp.		
CMPSMB17	Information Systems Issues	20			comp.	
CMPSMA23	Applications Programming	20				C
CMPSMB11	Database Manipulation	20			B	C
CMPSMB13	Internet and Multimedia Techniques	20	B	C	A/B	
CMPSMA27	Artificial Intelligence	20	A/B	C		comp.
CMPSMB20	Systems Engineering Issues	20	B		A/B	
CMPSMB33	Advanced Software Systems Development	20				
CMPSMC24	Data Mining	20	A/B	C	B	comp.
CMPSMC28	Applied Statistics	20	B		B	comp.
CMPSMC34	Distributed Computing	20	A/B	C		
CMPSME12	Information Visualisation	20	B	C	A	C
CMPSMI18	Computer Vision	20	B	C		
CMPSMC31	Advanced Programming Concepts and Techniques	20	comp.	C		
CMPSME27	Computer Graphics	20	A/B	C		
CMPSMI23	Human Computer Interaction	20	A/B	C	A/B	C
CMPSMI05	Audio and Visual Processing	20	B	C		

## Visit Report: University of East Anglia

### Appendix 3 BCS Accreditation Criteria

The following criteria were judged as Above Threshold for at least one programme. Exceptions can be found within the main body of the report, i.e. where a particular programme or groups of programmes were judged as either At or Below Threshold:

<b>Department Overview</b>	
<b>Section 1 Quality Assurance &amp; Enhancement</b>	
1.1	Programmes are influenced by research, industry and market requirements
1.2	Programmes are appropriately titled and specified using intended learning outcomes which are accessible to all stakeholders
1.4	Programmes are delivered and students supported, employing appropriate resources in terms of staff, learning materials, equipment and accommodation
1.5	Support of student engagement and development takes cognisance of individual ability and evidenced prior achievement
1.6	HEI regulations governing awards, as gauged through student achievement, properly underpin the fulfilment of the requirements of the accreditation sought
1.7	Programme assessment, in terms of subject content and level, is appropriate and is overseen through relevant QAA processes
1.8	Quality assurance and enhancement processes are effective in supporting the delivery and evolution of programmes
<b>Programme Based Issues</b>	
<b>Section 2 Core Requirements for Accreditation of Honours Programmes (and generalist masters programmes)</b>	
2.0	The programme contains sufficient computing content, as set out in table 1.5 of the guidelines
<b>Graduates have been assessed on the following abilities:</b>	
<b>Computing-related cognitive abilities</b>	
2.1.1	Knowledge and understanding of essential facts, concepts, principles and theories relating to computing and computer applications
2.1.2	The use of such knowledge and understanding in the modelling and design of computer-based systems
2.1.3	Recognise and analyse criteria and specifications appropriate to specific problems and plan strategies for their solution
2.1.4	Analyse the extent to which a computer based-system meets the criteria defined for its current use and future development
2.1.5	Deploy appropriate theory, practices and tools for the specification, design, implementation and evaluation of computer-based systems
2.1.7	Knowledge and understanding of the commercial and economic context
<b>Computing-related practical abilities</b>	
2.2.1	Specify, design or construct computer-based systems
2.2.2	Evaluate systems in terms of general quality attributes and possible trade-offs presented within the given problem
2.2.3	Recognise any risks or safety aspects that may be involved in the operation of computing and information systems within a given context
2.2.4	Deploy effectively the tools used for the construction and documentation of computer applications
<b>Transferable skills</b>	
2.3.1	An ability to work as a member of a development team
2.3.2	Development of transferable skills that will be of value in a wide range of situations
<b>Section 3 Additional Requirements for CITP</b>	
<b>Computing-related cognitive abilities</b>	
3.1.1	Knowledge and understanding of the methods and issues involved in deploying systems to meet business goals
3.1.3	Knowledge and understanding of systems architecture and related technologies for developing information systems
<b>Computing-related practical abilities</b>	
3.2.1	Use appropriate theoretical and practical processes to specify and deploy, verify and maintain information systems
3.2.2	Define a problem, research its background, understand the social context, identify constraints, understand customer and user needs, identify and manage cost drivers, ensure fitness for purpose and manage the design process and evaluate outcomes
3.2.3	Apply the principles, methods and tools of systems design to develop information systems that meet business needs
<b>Section 4 Additional requirements for CEng/CSci</b>	
<b>Computing-related cognitive abilities</b>	
4.1.1	Knowledge and/or understanding of the use of appropriate scientific and engineering principles
4.1.2	Knowledge and understanding of mathematical and statistical principles necessary to underpin their programme of study
4.1.3	Knowledge and understanding of the principles of computational modelling
<b>Computing-related practical abilities</b>	
4.2.1	Use appropriate theoretical and practical processes to specify, design, implement, verify and maintain computer-based systems
4.2.2	Define a problem, research its background, understand the social context, identify constraints, understand customer and user needs, identify and manage cost drivers, ensure fitness for purpose and manage the design process and evaluate outcomes
4.2.3	Apply the principles of appropriate supporting engineering and scientific disciplines
<b>Section 5 Supplementary requirements at Integrated masters level</b>	
5.1	Graduates should have been assessed on their demonstration of the following criteria, commonly met by a piece of team based major (30 credit) project work at level 6 or above: <ul style="list-style-type: none"> <li>• Their ability in applying practical and analytical skills present in the programme as a whole</li> <li>• Innovation and/or creativity</li> <li>• Synthesis of information, ideas and practices to provide a quality solution together with an evaluation of that solution</li> <li>• Awareness of wider customer contexts and the identification of problems that such contexts might deliver</li> <li>• The ability to work co-operatively (for example, as a team) to deliver a significant piece of work</li> </ul>
<b>Section 7 Core requirements for accreditation of Specialist Masters programmes</b>	
<b>Transferable skills</b>	
7.1.1	Carry out a critical review of the literature, current developments and available software as well as the associated software processes
7.1.2	Support the development of the self-directed learner who can set goals and select appropriate knowledge, skills, etc. as well as supporting tools for a particular purpose
7.1.3	Recognise and be able to respond in an appropriate way to opportunities for innovation
7.1.4	Participate effectively in the peer review process
7.1.6	Use appropriate processes to specify, design, implement, verify and maintain computer-based systems
7.1.7	Investigate and define a problem, identify constraints, understand customer and user needs, identify and manage cost drivers, ensure fitness for purpose and manage the design process and evaluate outcomes
7.1.8	Apply the principles of appropriate supporting disciplines

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	<b>Section 8 Masters Level Requirements for CITP Further Learning</b>
8.0	The programme contains sufficient computing content, as set out in table 1.5 of the guidelines
	<b>Computing-related cognitive abilities</b>
8.1.1	Demonstrate a systematic understanding of the knowledge of the domain of their programme of study
8.1.2	Demonstrate a comprehensive understanding of the essential principles and practices of the domain of the programme of study
	<b>Computing-related practical abilities</b>
8.2.1	Consistently produce work which applies and is informed by research at the forefront of the developments in the domain
8.2.2	Demonstrate the ability to apply the principles and practices of the discipline in tackling a significant technical problem
	<b>Section 9 Masters level Additional Requirements for CEng</b>
	<b>Computing-related cognitive abilities</b>
9.1.1	Systematic understanding of knowledge and a critical awareness of current problems and/or new insights in the development and implementation of systems
9.1.2	Comprehensive understanding of the state of the art techniques and methodologies for developing systems
	<b>Computing-related practical abilities</b>
9.2.1	Develop and apply new technologies
9.2.2	Show originality and innovation in the application of knowledge and techniques for developing systems
9.2.3	Make general evaluation of commercial risk through some understanding of the basis of such risks
	<b>Section 10 Masters level Additional Requirements for CSci</b>
	<b>Computing-related cognitive abilities</b>
10.1.1	Systematic understanding of knowledge, and a critical awareness of current problems and/or new insights in the area of computing science research
10.1.2	Comprehensive understanding of the scientific techniques applicable to their own research or advanced scholarship
10.1.3	Understand and be able to participate within the legal, social ethical and professional framework in computing science
	<b>Computing-related practical abilities</b>
10.2.1	Show a critical awareness of current research issues, problems and/or insights
10.2.2	Show an ability to apply appropriate quantitative and qualitative research methods and tools for creating and interpreting knowledge
10.2.3	Make general evaluation of scientific risk through some understanding of the basis of such risks
	<b>Section 11 Project Requirements</b>
11.1.3	The individual project within an <b>undergraduate honours</b> or <b>integrated masters</b> degree should be a piece of work of at least 30 credit points at level 6.
	The individual project within an <b>ordinary or foundation degree</b> for IEng should be a piece of work of at least 20 credit points level 5 or above.
	The individual project within a <b>specialist masters</b> degree should be a piece of work of at least 60 credit points at level 7.
	The individual project within a <b>generalist masters</b> programme should be a piece of work of at least 30 credit points at level 6 or above
11.1.4	All projects should reflect the title and the aims and learning outcomes which characterise the programme
11.1.5	A project undertaken at masters level should reflect the ethos of advanced study and scholarship appropriate to a masters degree
11.1.6	The project must be passed without compensation
11.1.7	In the event of this major activity being undertaken as a group enterprise, there is a requirement that the assessment is such that the individual contribution of each student is measured against the learning outcomes

**Visit Report: University of East Anglia**  
**For BCS Office Use Only**

**Any Multiple site/Franchise Arrangements**      No

**Direct Entrants**      Yes to L5 but numbers low. Not permitted at L6

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**Date Report Considered at AAC:** 15 February 2016

**Minute Number:** AAC/2016/011 6.5

**Next Visit**

**Type 1**

**Type 2**

**Eligible for Type 2 at next visit**      No

**Next Visit Due**      **Academic Year:** 2020

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**90 Day Response Required:** Yes

**Date 90 Day Response submitted to AAC:** DD Month YYYY

**Minute Number:** AAC/YYYY/XXX X.X

**Outcome:**

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**Change of Titles**

**List of Programme Titles**

**Date Submitted to AAC:**

**Outcome:**

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**Dialogue with Education Team following visit which may affect future accreditation including changes at University level**

**Date Received:**

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**Details of Postponement of Visit and reasons why**

**Date Received:**

## Appendix A – Approved Key Information Set (KIS) Statements

	HESA ACCTYPE	Accreditation Type Wording For Unistats Website	Corresponding Accreditation Type URL for Unistats Website
1	01101	Accredited by BCS, The Chartered Institute for IT for the purposes of fully meeting the academic requirement for registration as a Chartered IT Professional.	<a href="http://www.bcs.org/accredited">www.bcs.org/accredited</a>
2	01102	Accredited by BCS, The Chartered Institute for IT for the purposes of fully meeting the further learning academic requirement for registration as a Chartered IT Professional.	<a href="http://www.bcs.org/accredited">www.bcs.org/accredited</a>
3	01103	Accredited by BCS, The Chartered Institute for IT for the purposes of partially meeting the academic requirement for registration as a Chartered IT Professional.	<a href="http://www.bcs.org/accredited">www.bcs.org/accredited</a>
4	01104	Accredited by BCS, The Chartered Institute for IT on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for registration as a Chartered Engineer.	<a href="http://www.bcs.org/accredited">www.bcs.org/accredited</a> <a href="http://www.engc.org.uk/education-skills/course-search/acad">www.engc.org.uk/education-skills/course-search/acad</a>
5	01105	Accredited by BCS, The Chartered Institute for IT on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for Incorporated Engineer and partially meeting the academic requirement for a Chartered Engineer.	<a href="http://www.bcs.org/accredited">www.bcs.org/accredited</a> <a href="http://www.engc.org.uk/education-skills/course-search/acad">www.engc.org.uk/education-skills/course-search/acad</a>
6	01106	Accredited by BCS, The Chartered Institute for IT on behalf of the Science Council for the purposes of fully meeting the academic requirement for registration as a Chartered Scientist.	<a href="http://www.bcs.org/accredited">www.bcs.org/accredited</a>
7	01107	Accredited by BCS, The Chartered Institute for IT on behalf of the Science Council for the purposes of partially meeting the academic requirement for registration as a Chartered Scientist.	<a href="http://www.bcs.org/accredited">www.bcs.org/accredited</a>
8	01108	Accredited by BCS, The Chartered Institute for IT on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for Incorporated Engineer registration.	<a href="http://www.bcs.org/accredited">www.bcs.org/accredited</a> <a href="http://www.engc.org.uk/education-skills/course-search/acad">www.engc.org.uk/education-skills/course-search/acad</a>
9	01109	Accredited by BCS, The Chartered Institute for IT on behalf of the Engineering Council for the purposes of partially meeting the academic requirement for registration as an Incorporated Engineer.	<a href="http://www.bcs.org/accredited">www.bcs.org/accredited</a> <a href="http://www.engc.org.uk/education-skills/course-search/acad">www.engc.org.uk/education-skills/course-search/acad</a>

## Appendix A – Approved Key Information Set (KIS) Statements

The accuracy of these statements on both the Unistats and HEI's websites is crucial, especially in the light of potential misleading of students and any possible resulting legal action. The following table may be useful in selecting the correct statements:

<b>Levels of Accreditation</b>	<b>E.g.</b>	<b>KIS Statements</b>
Full CIP, CIPFL, Full CEng/CSci	MComp/MEng/MInf/MSci	1, 2, 4, 6
Full CIP, CIPFL, Full CEng		1, 2 and 4
Full CIP, CIPFL, Full CSci		1, 2 and 6
Full CIP, CIPFL		1 and 2
Full CIP, Partial CEng*/CSci	BSc (Hons)/BEng (Hons)	1, 5 and 7
Full CIP, Partial CEng*		1 and 5
Full CIP, Partial CSci		1 and 7
Full CIP		1
Partial CIP	BSc/BEng (Joint Honours)	3
IEng	BSc/BEng (Ordinary)	8
Partial IEng	FdSc/HND	9

**\*Dual Accreditation:** All Honours degrees accredited for CEng (partial fulfilment) registration from intake year 1999 meet the requirements for standard route IEng registration and Sydney Accord recognition.



## **GENERAL CONDITIONS WHICH APPLY TO ARRANGEMENTS FOR BCS ACCREDITATION**

*The following is a summary of the conditions that apply to all accreditation granted by the BCS, The Chartered Institute for IT. Further details are included in the Institute's Guidelines on Course Accreditation, which can be accessed on the BCS web page at: <http://www.bcs.org/accreditation>*

1. To be covered by an accreditation decision, students must complete the equivalent of the final taught year (or part-time equivalent) of three year degree courses and for HNDs/Foundation degrees. This equates to at least the final year (or part-time equivalent) of the taught part of the course

Examples of failures to meet the above conditions are APL, or a period of study on an overseas or franchised version of the course, unless such courses have been separately considered for accreditation by the Institute.

2. Graduates or diplomates must have passed without compensation a major project. This must be located in the final year apart from the MEng/MComp/MSci/MInf where it can be located in either the final or penultimate year.
3. Where successful completion of certain modules has been specified as a condition of exemption or accreditation, it is required that these are taken in addition to those modules which were identified as compulsory at the time of the visit.
4. For Chartered IT Professional registration it will be necessary for students undertaking a Bachelors Honours degree programme to complete a year of further learning beyond graduation. For those completing a programme which is accredited as partially meeting the educational requirements further learning at an appropriate level will be required.

For Chartered Engineer or Chartered Scientist registration, it will be necessary for students undertaking a Bachelors Honours degree programme which is accredited as partially meeting the educational requirements, to complete either an appropriate accredited Masters degree or appropriate further learning to Masters level.

For Incorporated Engineer registration, it will be necessary for students undertaking an HND/Foundation degree programme which is accredited as partially meeting the educational requirements, to complete appropriate further learning to Bachelors degree level.

It is important that all prospectuses or other documents which refer to the accreditation status of these courses make this clear.

5. The Institute must be informed of arrangements to franchise courses to another institution(s) in whole or in part. Franchised versions of courses do not automatically share any exemption or accreditation granted to the parent course and accreditation must be sought separately.
6. Where a course is franchised to, or run jointly with another institution(s), the final award certificate must indicate the site at which the course was studied. Alternatively, and in agreement with the BCS, the institution must supply an annual list of graduates or diplomates from the accredited site to the Institute. Failure to comply with this

clause will prejudice approval and accreditation of all courses offered by that institution.

7. Over the normal period of accreditation, the Institute would expect and encourage minor evolutionary changes to enhance the relevance of a course. Should any major change (whether approved by an internal validation process or not) be made to any accredited course, the HEI is required to inform BCS so that it can decide whether existing accreditation may continue. A major change is considered to be any or all of the following:
  - replacement; movement between study years or significant content revision of any module defined as compulsory (see 3 above);
  - any shift in the balance of main themes or subject areas previously notified to the Institute;

*These are only examples of changes that must be notified to the Institute. If you are unsure whether an alteration to an accredited course constitutes a major change or not, please contact the BCS Education Team at: [educ@hq.bcs.org.uk](mailto:educ@hq.bcs.org.uk)*

8. The Institute expects to be informed of significant changes to the learning environment in which a course is delivered. Changes to the Quality Assurance system, the compensation requirements and/or the Learning Support must be communicated to the BCS Education Team.
9. Changes of course title must be communicated to the Institute in order to facilitate the BCS admissions procedures and minimise the risk of inconvenience to Membership applicants. For CEng and IEng accredited courses the Institute is also required to notify the Engineering Council of such changes and for CSci courses changes to be notified to the Science Council.

***Where any of these conditions are not met, the Institute reserves the right to suspend or withdraw accreditation from a course or courses.***

## BCS Educational Affiliate Member and Accredited Degree logos

### The logos



Universities and colleges are encouraged to use the BCS Educational Affiliate Member logo to promote their institutions being accredited by BCS. The Accredited Degree logo should be used to promote specific programmes that have been accredited.



The logos may be used on the university or college website and in the prospectus or other material promoting accredited programmes. Please note that the Accredited Degree logo must only be used with a programme that currently holds accredited status, and care must be taken not to mislead potential students if, for example, accreditation is about to expire.

### How to use

The logo can be downloaded from the BCS website at [BCS Educational Affiliate Member and Accredited Degree logos](http://www.bcs.org/category/17683) (<http://www.bcs.org/category/17683>)

### Explanation of accredited status

The following wording, aimed at potential students, may be used with the logo to explain the meaning and to promote the value of accredited status.

#### **CITP**

*This degree has been accredited by BCS, The Chartered Institute for IT. Accreditation is a mark of assurance that the degree meets the standards set by BCS. An accredited degree entitles you to professional membership of BCS, which is an important part of the criteria for achieving Chartered IT Professional (CITP) status through the Institute. Some employers recruit preferentially from accredited degrees, and an accredited degree is likely to be recognised by other countries that are signatories to international accords.*

#### **CEng/IEng**

*This degree has been accredited by BCS, The Chartered Institute for IT on behalf of the Engineering Council. Accreditation is a mark of assurance that the degree meets the standards set by the Engineering Council in the UK Standard for Professional Engineering Competence (UK-SPEC). An accredited degree will provide you with some or all of the underpinning knowledge, understanding and skills for eventual registration as an Incorporated (IEng) or Chartered Engineer (CEng). Some employers recruit preferentially from accredited degrees, and an accredited degree is likely to be recognised by other countries that are signatories to international accords.*

#### **CSci**

*This degree has been accredited by BCS, The Chartered Institute for IT on behalf of the Science Council. Accreditation is a mark of assurance that the degree meets the standards set by BCS. An accredited degree will provide you with some or all of the underpinning knowledge, understanding and skills for eventual registration as a Chartered Scientist (CSci). Some employers recruit preferentially from accredited degrees, and an accredited degree is likely to be recognised by other countries that are signatories to international accords.*

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The Engineering Council logo may be found and downloaded from:  
[www.engc.org.uk/education-skills/accreditation-of-higher-education-programmes/information-for-higher-education-providers/accredited-degree-logo/](http://www.engc.org.uk/education-skills/accreditation-of-higher-education-programmes/information-for-higher-education-providers/accredited-degree-logo/)