Introduction

The MSc course in Computer Science and Applications (CSA) is an interdisciplinary taught course designed to give students with a first degree in Computer Science or a related discipline the opportunity to pursue the subject to a high level.

The course includes a dissertation project that offers the opportunity to specialise and explore the topics covered in greater depth, or to explore new areas. Dissertations may be research-focused or be directed towards the practical application of advanced topics in Computer Science, and there is scope for commercial or industrial collaboration.

Students develop the skills needed by the professional in the many areas in which computer science is applied, from bioinformatics and adaptive systems, to multimedia and agent-based systems. The course is aimed at students wishing to pursue a career in any of these areas, in an academic or industrial setting and is informed by Warwick’s leading edge research. There is a large element of flexibility in the choice of taught material, so that students may specialise in the area that most closely matches their interests and career plans.

This booklet provides an introduction to the Department and an overview of the CSA course. More general information about the University can be found in the University’s Postgraduate Prospectus and website. The Department’s own website contains further information about the modules currently available and our other teaching and research activities.
The University of Warwick

The University of Warwick was established in 1964 on the southern outskirts of Coventry, where the city meets the county of Warwickshire. Its central location means that it is within easy reach of Birmingham, the unspoilt countryside of the Cotswolds and the Chilterns, and of picturesque and historic centres such as Stratford-upon-Avon and Oxford. London is easily accessible by train or motorway.

The University of Warwick is a place of study for nearly 23,000 students, including nearly 10,000 postgraduates, and employs over 5,000 staff across a range of University departments. Warwick is research-led and is committed to providing undergraduate and postgraduate teaching of the highest quality. The University is consistently ranked in the top ten UK universities in the national league tables.

Warwick has a lively modern campus, impressively landscaped to complement natural features such as copse, streams. The campus has a recently expanded range of retail outlets and offers a safe supportive environment in which to live and study. All main areas of the campus are covered by wireless hotspots. High quality, competitively priced on-campus accommodation is available along with University-leased and private off-campus accommodation in nearby Coventry, Kenilworth or Leamington Spa.
The University boasts the largest Arts Centre outside London, combining theatres, a concert hall, cinema, art gallery, bookshop and Music Centre. There are also first class sports facilities on campus including a Sports Centre, Games Hall, climbing wall, running track, tennis courts and playing fields. Over 250 clubs and societies are organised by an active Students Union (one of the biggest in the country) that provides a vast range of facilities, activities, entertainment venues and bars, and contributes substantially to student life at Warwick.
Established in 1969, the Computer Science Department was one of the first departments on the campus and has steadily grown with the increased demand for our courses and research. Currently, the Department has 29 full-time academic staff and 12 support staff together with a population of nearly 350 undergraduates, 33 taught MSc students, and over 70 research associates and research students.

Sited in a green space, the Department is housed in purpose-built accommodation adjacent to the Mathematics Institute. Students have 24-hour access to high quality desktop workstations and server resources, including cluster computing with gigabit interconnection. Secure wireless facilities are available for personal laptops.

The Department offers a stimulating research environment and has consistently achieved the highest rankings for both its teaching and research. Research in the Department is centred on four research groups, Foundations of Computer Science, Computational Biology and Bioimaging, Performance Computing and Visualisation, and Intelligent and Adaptive Systems, and encompasses a variety of topics ranging from advancing the foundations of computing to exploring novel interdisciplinary applications.

Activity in the Department is strengthened by a range of national and international collaborations, both with other academic institutions and with industry. Thus, students undertaking the MSc degrees will have the opportunity to engage with a stimulating research environment, through lectures, seminars and their dissertation project work, involving direct interaction with the research groups in their chosen specialism.
MSc in Computer Science and Applications

The CSA MSc is a research-led one-year taught course. It provides a choice from a range of advanced topics at the frontiers of Computer Science, together with their application to business, technology, science and education. The course has been designed for graduates with a Computer Science or scientific and computational background, and provides a solid preparation for the use of cutting-edge tools, techniques and technologies in an industrial or business setting. The course also provides an excellent grounding for further research, either through PhD study or in a commercial setting. There are approximately 25 places available, with a small number of scholarships offered for international students.

CSA adopts an interdisciplinary approach, and encompasses modules from areas that complement the core topics of Computer Science. Some of these modules address the application of advanced computing techniques to areas such as mathematics, science and education, and others the study of new fields such as computational and systems biology.

Students select approximately 6 modules from an extensive list of options in the first six months of the course, to be complemented by a module on research methods and a dissertation project. The modules available are reviewed and updated on an annual basis to take account of topical developments in Computer Science research and applications. More detailed descriptions are available online at go.warwick.ac.uk/csa-msc. The following list gives a brief introduction to the modules available at the time of writing.

- **Multimedia Processing, Communications and Storage**
  Provides in-depth knowledge of digital multimedia storage and communications technologies: including data acquisition, compression, interpretation, presentation and interaction. Gives practical experience of programming components of multimedia systems.

- **Agent-Based Systems**
  An advanced introduction to agent-based systems, covering theoretical foundations, recent research and practical deployed applications. Describes fundamental techniques and systems, illustrated by real-world applications.

- **High Performance Computing**
  Introduces the hardware design of modern parallel computing platforms and the corresponding programming models. Covers principled methods for measuring and characterising performance, and issues such as administration, scheduling, and data management.

- **Advanced Specification Methods**
  Studies methods for designing, analysing and programming complex computing systems. Considers techniques for the specification, design, and implementation of such systems throughout the software lifecycle.

- **Computing Security**
  Introduces computing security from a system wide perspective, including language-based security, network security, and operating system security. The module also covers new areas such as quantum cryptography, proof-carrying code, etc.
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<tr>
<th>Course Title</th>
<th>Description</th>
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<tr>
<td>Introduction to Empirical modelling</td>
<td>Introduces an alternative conceptual framework for computing with wide applications in business, engineering and education. Involves the study of principles and tools for explanatory and exploratory modelling based on the fundamental concepts of observables, dependency and agents.</td>
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<tr>
<td>Computational Biology</td>
<td>An overview of research methods and technologies in computational biology and bioinformatics. Includes topics such as finding genes in DNA sequences, interpreting gene sequences, protein classification, data mining for gene and protein expression patterns, and modelling cellular interactions and processes.</td>
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<td>Algorithmic Game Theory</td>
<td>Covers game theory as a formal method for strategic interaction. Discusses the algorithmic and computation complexity aspects of game-theoretic models with a focus on recent advances and current research.</td>
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<tr>
<td>Dynamic Web-based Systems</td>
<td>Introduces advanced concepts in web-based systems, such as adaptive hypermedia, adaptive web-based systems, authoring, the semantic web, the social web and applications.</td>
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<td>Data Mining</td>
<td>An overview of data mining techniques, including algorithms developed to address different data mining goals and the application of these algorithms to real-world problems.</td>
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<tr>
<td>Modelling and Simulation</td>
<td>Addresses data handling, data mining and data analysis with emphasis on biological problems. Includes translating biological problems into mathematical models, and the biological interpretation of such models. Discusses the wider issues of the status of modelling in modern science.</td>
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<tr>
<td>Computation 1: Numerical Methods</td>
<td>Focuses on numerical methods for data analysis, modelling and simulating dynamical processes. Discusses the application of specific numerical techniques to various standard scientific problems, such as image analysis.</td>
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<tr>
<td>Computation II: Molecular Methods</td>
<td>Introduces molecular modelling techniques as applied to biological systems, with particular emphasis on the methods used and their underlying theory.</td>
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<tr>
<td>Monte Carlo Methods</td>
<td>Covers the foundations and advances in Monte Carlo simulation techniques. Introduces a collection of simulation methods, and their advantages, disadvantages, strengths and pitfalls for scientific applications.</td>
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Teaching, Learning and Individual Support

A range of teaching and learning styles are employed including formal lectures and small group tutorials. There is an active postgraduate Student-Staff Liaison Committee (SSLC), which provides a forum for students to contribute to the development of the MSc course. Student feedback on modules is routinely sought and monitored.

The Department operates a personal tutor system to provide students with individual academic and non-academic advice and assistance. Additional support can also be obtained from the University Senior Tutor's Office and from the Students’ Union Welfare Office.

The Department provides 24-hour access to its computer workrooms by means of a card access system. Secure remote access to the Department’s computing facilities is also available, and all study bedrooms on campus have network connections.

International Students

Our courses take a global view of computing, and the Department welcomes suitably qualified international students. Applicants must demonstrate proficiency in written and spoken use of English with a normal expected minimum IELTS score of 6.5 or a TOEFL score of 92. Exceptions to these requirements can be made under certain circumstances with prior agreement from the Department.

A small number of scholarships are offered for international students. Details can be found on the Department website.

The International Office offers a personal service to all international students before they arrive and during their time at Warwick. All students receive a Welcome Guide for International Students that contains information on life in Britain, life at Warwick and how to prepare for arrival in the UK. The International Office organises a four-day Orientation Programme, beginning with a free coach pick up from Heathrow Airport, to welcome students to Warwick. An extensive social programme is offered with trips to places of interest throughout the UK as well as parties and other activities in term time and during the vacations. The International Office also works closely with the Students Union Advice and Welfare Service to provide a full range of support and advice services for students from overseas. For more details see the International Office website: go.warwick.ac.uk/international.

Staff and students at Warwick represent a wide spectrum of over 120 nationalities and ethnic groups. There are many international cultural societies, which organise their own events. Once a year all of these societies join together in “One World Week” an international festival of music, costume, drama and dance, which has become one of the biggest festivals of international culture in Europe.
Graduate Profiles

Graduates from our MSc courses are well placed for the job market and to undertake further study towards a PhD, both in the UK and overseas. A selection of graduate profiles are available on the Department website. We have included examples of comments from our alumni below.

“After completing my MSc I had no problems acquiring a graduate position and started work for a company specialising in IT security and data analysis; Detica.

My time at Warwick equipped me with the right skill set and knowledge required to pursue my interests, and has allowed me to find a job in a field that I find interesting and engaging. Since leaving, I have found that the material I covered throughout the course was relevant and in sufficient depth as to put me on an equal footing with, or better than, my peers.”

James McHugh (2010)

“Immediately after graduating from Warwick, I was hired as an analyst developer in a global asset management company. I attribute my success to the financial blog mining research involved in my dissertation along with the constant guidance of my supervisor.

Graduating in MSc from Warwick has been an enriching experience in terms of knowledge, independence and self development. I would wholeheartedly recommend the Department of Computer Science for their competitive courses and exceptional faculty. The biggest benefit was that the relatively small class size ensures the individual development of each student. The professors were easily accessible and always ready to provide support.”

Darshana Nair (2011)

“Two years ago, I completed the MSc course at Warwick and then spent a month applying some of my knowledge working with the ITS department. Life at Warwick was a fascinating, fulfilling and transformative experience.

Aside from the beautiful campus and amazing atmosphere, the greatest benefit I gained from Warwick was the ability to learn how to quickly learn and adapt to a rapidly changing world. This experience no doubt played a large role in helping to cultivate my current experience as a web developer at a promising food delivery start-up in Beijing. The foundation that Warwick provided helped me quickly master a wide array of technical skills allowing me to proficiently design and implement the tools needed to support a comprehensive e-commerce system.”

‘Vincent’ Zhe Zhang (2010)
Applying to Warwick

The course described here is available to traditional students as well as non-traditional applicants such as mature students. Prospective students must have a BSc or equivalent; the admission threshold is 2.2 or equivalent.

The application process for this course conforms to the standard application process for postgraduate degree courses at the university. The online application form can be found at:

[go.warwick.ac.uk/pgapply](go.warwick.ac.uk/pgapply)

It you do not yet have a final result for your undergraduate degree, you can still apply. We are able to make you a conditional offer based on prior performance in your degree, as evidenced by your transcripts, together with your predicted final grade.

Original (or attested copies of) documentation confirming all of the information you provide at application must be made available to the University when requested or, in the case of your final degree results, when available. Once you have satisfied all of the academic conditions of your offer, we will be able to make the offer unconditional.

You will receive updates on the progress of your application by email from the Postgraduate Admissions Team, and you can track the status of your application online. Otherwise, you can contact the Postgraduate Admissions Office on their enquiry form at:

[www.warwick.ac.uk/go/contactpgadmissions](www.warwick.ac.uk/go/contactpgadmissions)
1) Check university requirements

2) Apply online

3) Have you submitted supporting documents?
   Yes (Procedure takes approximately 4 weeks)
   No

   3a) Receive ‘Conditional’ Offer
   3b) Accept offer?
   3c) Submit supporting documents?

4) Receive ‘Unconditional’ Offer

5) Accept offer

6) Do you need a UK Visa?
   Yes
   6a) Apply for Visa
   No

7) Apply for Accommodation
   Deadline: 31 July

8) Enrol online
   From September

9) Arrive at Warwick
   Late September/Early October
Further Information

Computer Science and Applications
University of Warwick
Coventry
CV4 7AL

+44 (0)24 7652 2424
+44 (0)24 7257 3024
msc-admissions@dcs.warwick.ac.uk
www.dcs.warwick.ac.uk

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