COMPUTER SCIENCE

PROSPECTUS 2020

COLLEGE OF SCIENCE

Swansea University
Prifysgol Abertawe

Contents

GET IN TOUCH

If you have any questions, you can get in touch:

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Welcome to
THE COLLEGE OF SCIENCE

It's fantastic that you are considering Swansea University as your next step towards a bright future and career. As Head of Science, I wanted to tell you how important every member of our community is: if you join us, you'll be able to play an important role in the world-changing work we do.

We are proud to welcome people into our 'family' from many backgrounds and from around the world. Science moves forward where there is diversity and we encourage many perspectives, voices and hearts to become involved in our activities as we become one of the most creative, welcoming and recognised centres of science globally.

During your time with us we will do everything we can to help you thrive and flourish; giving you the knowledge, skills and outlook for a fulfilling career and a good life. You'll meet people – fellow students and staff – who will have a life-long impact on you and you'll be encouraged to share your knowledge with others, too.

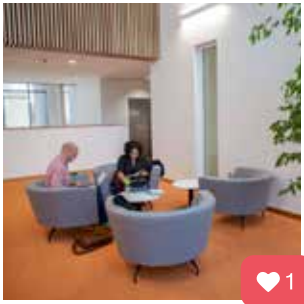
In this brochure, you'll find specific information on your specialist subject. You'll see that you'll be taught by world-leading researchers and teachers who are committed to your education. You'll read about the range of jobs and careers your education will open up for you and the high success rate our students have in finding the future that is right for them. Reading about this is all very interesting, but please do come and visit us, too, so you can get a sense of the excitement and excellence that is part of our DNA.

Professor Matt Jones,
Head of the
College of Science

QS WORLD UNIVERSITY RANKINGS 2019
COMPUTER SCIENCE & INFORMATION SYSTEMS
RANKED

ACCREDITED DEGREE

Accredited by the
BRITISH COMPUTER SOCIETY



FOLLOW US AND KEEP UP TO DATE WITH ALL THINGS SCIENCE

7TH IN THE UK OVERALL

(The Times/Sunday Times/Sunday Times Good University Guide, 2019)

Our students love studying Computer Science at Swansea University. We are ranked 4th in the UK for overall student satisfaction in The Guardian University Guide, 2019. See how we compare with some other universities in the UK for Computer Science.

Swansea	**4th**
Southampton	5th
Bristol	11th
Loughborough	27th
Cardiff	43rd
University of South Wales	78th
Surrey	87th

(Source: The Guardian University Guide, 2019, ranking on overall student satisfaction)

COMPUTER SCIENCE COURSES

G400
BSc COMPUTER SCIENCE

G40A
BSc COMPUTER SCIENCE WITH A YEAR IN INDUSTRY

G40C
BSc COMPUTER SCIENCE WITH A YEAR ABROAD

G600
BSc SOFTWARE ENGINEERING

G60A
BSc SOFTWARE ENGINEERING WITH A YEAR IN INDUSTRY

C60B
BSc SOFTWARE ENGINEERING WITH A YEAR ABROAD

G401
BSc COMPUTER SCIENCE WITH INTEGRATED FOUNDATION YEAR

G403
MEng COMPUTING

G40B
MEng COMPUTING WITH A YEAR IN INDUSTRY

G40D
MEng COMPUTING (WITH A YEAR ABROAD)

G4G4
MSci COMPUTER SCIENCE

G847
MSci COMPUTER SCIENCE WITH A YEAR IN INDUSTRY

G4G2
MSci COMPUTER SCIENCE WITH A YEAR ABROAD

X2C1
BSc EDUCATION AND COMPUTING

BSc APPLIED SOFTWARE ENGINEERING

Welcome to

THE DEPARTMENT OF COMPUTER SCIENCE

The Computer Science Department at Swansea University has one mission: to be a world-leading centre for digital innovation. We are a multifaceted department which boasts an international team with strengths in teaching, research and community engagement. As a student of the department you will learn first-hand from world-leading teachers and researchers about a subject which is rich in applications, and study topics around data, algorithms, programs, systems, computers and devices.

Computer science is the leading discipline stemming from a long tradition of mechanisation in our world. It is a subject destined to grow in influence and achieve more and greater things for decades to come. An education in computer science from Swansea will provide you with the competence to participate in an ongoing revolution.

The knowledge you will gain during your time here will enable you to understand the challenges the world is facing, and foresee great opportunities open to us as we move forward into the future.

Professor Arnold Beckmann,
Head of Department of Computer Science

Computational Foundry

The Computer Science Department is based in our £32.5 million world-class Computational Foundry, which acts as a beacon for research collaborations; attracting leading researchers to Wales and placing Swansea at the heart of a thriving regional ecosystem of digital companies and research.

The Computational Foundry is backed by £17m from the European Regional Development Fund and drives research into computational and mathematical sciences, making Wales a global destination for computational scientists and industrial partners.

Swansea's vision is to nurture and grow a dedicated community of computational and mathematical scientists who pursue transformative research, in the knowledge that better computational science is vital in building a progressive world: socially, economically, culturally, philosophically and intellectually.
The facility features dynamic learning and collaborative spaces including cutting-edge laboratories, lecture rooms and a light-filled atrium.

The Computational Foundry brings Mathematics and Computer Science under one roof, which offers fresh opportunities for collaborative research and scholarship.

Historically, computation began in mathematics, and now the two come together again undergirding the digital revolution where aspects of computation and data permeate every aspect of our everyday lives, from our homes and jobs to transport, government and healthcare.

The world is at a tipping point, not least in the potential of digital technology to make lives better or worse. In the news we see the potential of social media to undermine democracy, but also the way big data can transform healthcare.

The team in the Computational Foundry brings together deep theoretical fundamentals and engagement with current technology. The Foundry acts as a nexus drawing together threads of digital understanding to inspire and nurture new world-changing research.

The Department of Computer Science at Swansea University is ranked 7th in the UK and 1st in Wales within its subject area in the prestigious Times and Sunday Times Good University Guide 2019.

Not only is the Computational Foundry a crucible for world-leading research, but the knowledge generated is also being passed on to students, giving them an exciting educational experience and creating a new generation which is capable of contributing to our increasingly digital society.

Professor Alan Dix,
Director of the Computational Foundry

TECHNOCAMPS

Technocamps is the pan-Wales schools and community outreach unit of the Computer Science Department at Swansea University.

The mission of Technocamps is to provide a wide spectrum of activities aimed at identifying and addressing shortcomings in computing education in schools, and thereby increase the number of pupils – particularly girls – studying computer science at GCSE, A-Level and beyond.

Technocamps' primary offerings are one-day hands-on computing workshops to inspire, motivate and engage young people in secondary schools. Its Playground Computing programme focusses on engaging with primary school pupils, and its Technoteach programme provides teachers with the confidence and competence to deliver computer science in their schools. Since 2001 Technocamps has engaged with over 45,000 young people – well over 1% of the population of Wales – a full 43% of which were girls, as well as provided training to over 500 teachers.

Students in the Department are given the opportunity to become Technocamps Ambassadors, delivering Technocamps Workshops to local school pupils and leading weekly Technoclubs. This provides an excellent way for students to become more confident at communicating their ideas, and even allows some to discover a passion for teaching!

In 2018 Technocamps was awarded £5.3 million of European funding to deliver STEM enrichment programmes to cultivate the links between computer science and STEM within secondary schools across Wales.

www.technocamps.com

TEACHER TRAINING

Did you know that you can now train to be a secondary teacher at Swansea University?

Once you've finished your BSc course, you can progress to study a PGCE here at the University and become a qualified ICT teacher.

Visit **www.swansea.ac.uk** to find out more.

- **BAY LIBRARY**
- **COMPUTATIONAL FOUNDRY**
- **ENGINEERING**
- **STUDENT ACCOMMODATION**
- **SCHOOL OF MANAGEMENT**
- **THE COLLEGE**
- **THE CORE, FOOD COURT**
- **THE GREAT HALL**
- **SPORT AND EXERCISE SCIENCE**

24HR BUS (term-time)
Approximately 20 minutes to Singleton Campus, 10 minutes to city centre

MY UNIHUB
Your one-stop-shop offering information and guidance on any aspect of student life; from finances, to course-load, to housing

OTHER FACILITIES:
- Coffeeopolis coffee shop
- Faith space
- Gym and sports facilities
- Launderette
- Students' Union

Santander COSTA COFFEE TESCO


See for yourself
check out our virtual tour around campus!
360 VIRTUAL TOUR
BEACHFRONT LOCATION
swansea.ac.uk/virtual-tour

UCAS CODE: G400
3 YEARS FULL TIME
TYPICAL OFFER: AAB – BBB
to include GCSE Mathematics at grade B/6

BSc COMPUTER SCIENCE

The BSc in Computer Science is a three-year programme designed to teach you the central ideas and methods of computing.

The degree will teach you how to identify solutions to problems and measure their efficiency, analyse and assess systems, and design new ones.

You will be able to learn about computer graphics, computer systems modelling, software engineering, data visualisation, how to write mobile apps and some of the more advanced theoretical aspects of computer science.

You'll be able to develop your programming skills in C and Java. You'll learn about algorithms, concurrent systems, engineering, data visualisation and various software programming paradigms. You'll tackle advanced tasks, both individually and in groups, and will gain and develop valuable transferable skills, including team working, communication, presentation and problem-solving.

UCAS CODE: G600
3 YEARS FULL TIME
TYPICAL OFFER: AAB – BBB
to include GCSE Mathematics at grade B/6

BSc SOFTWARE ENGINEERING

The BSc Software Engineering degree concentrates on the skills needed for a career in the software industry and focusses on the process of building software to a specification. This is a vital skill in modern computer science, and this degree will give you a strong grounding for a range of dynamic careers in related fields such as data science, security analysis and emerging technologies.

Students on our Software Engineering degree scheme will study the fundamental elements of computer science before progressing on to team working skills in year two.

You will be challenged to solve problems in situations common to standard industry practice such as needing to complete work started by other teams and inter-team collaborative projects.

In your final year you will move on to software testing, design patterns and generic programming, and you will complete a practical project, involving building a software system. The range of transferable skills you will gain include team-working, communication, presentation and problem-solving, and will prove vital when it comes to securing employment in a competitive field.

For our preferred A-Level subjects and GCSE maths requirements, please visit the course pages:
www.swansea.ac.uk/compsci/undergraduate

UCAS CODE: G401
4 YEARS FULL TIME
TYPICAL OFFER: CCC – CCD
to include GCSE Mathematics at C/5 grade

BSc COMPUTER SCIENCE WITH INTEGRATED FOUNDATION YEAR

The BSc Computer Science with Foundation Year degree is ideally suited to students who do not have the appropriate qualifications to go directly into the three-year BSc in Computer Science.

The foundation year includes a wide range of relevant content that will prepare you for the BSc in Computer Science, as well as enabling you to experience other subjects in science at Swansea. The degree will teach you how to identify solutions to problems and measure their efficiency, analyse and assess systems, and design new ones. You will be able to learn about computer graphics, computer systems modelling, software engineering, data visualisation, how to write mobile apps and some of the more advanced theoretical aspects of computer science.

You'll be able to develop your programming skills in C and Java. You'll learn about algorithms, concurrent systems, engineering, data visualisation and various software programming paradigms. You'll tackle advanced tasks, both individually and in groups, and will gain and develop valuable transferable skills, including team working, communication, presentation and problem-solving.

UCAS CODE: X2C1
3 YEARS FULL TIME
TYPICAL OFFER: ABB – BBB
to include GCSE Mathematics at grade B/6

BSc EDUCATION AND COMPUTING

The BSc Education and Computing joint honours degree is intended for students who wish to develop their knowledge and skills in computing and how this subject applies to education and the wider society. It will enable students to specialise in both Education and Computing, developing a mix of skills and knowledge which will enhance their future career prospects and prepare them for a role in computing education. Designed for both UK/EU and international students, our BSc Education and Computing programme considers:

Education in a wider context, not just within formal primary and secondary school settings, but also further/higher education, social services, local and national government, and education within the community.

A wide range of computing skills, including how to program (e.g. C and Java) and analyse a wide range of computing systems, and the fundamental mathematics and theory of computer science. Students will learn about operating systems and networking, computer graphics, compilers, scientific modelling, mathematical abstraction, databases, and advanced and specialised programming. Students will also develop an excellent working knowledge of professional standards in the computing education sector and in industry more widely.

UCAS CODE: G4G4
4 YEARS FULL TIME
TYPICAL OFFER: AAA – ABB

MSci COMPUTER SCIENCE

Computer science plays a key role in virtually every aspect of modern life, and this integrated Master's level degree is ideal for those wanting to pursue a career where problem solving is based on rigorous scientific principles.

As an MSci Computer Science student, you will have the opportunity to learn about computer graphics, algorithms, concurrent systems and various programming paradigms. As part of your studies you will be introduced to automata, formal language theory and human-computer interaction. Students will undertake a large scientific project, accounting for 25% of the credit for the year, using problem-solving principles, drawing on the research strengths of the department in the areas of Human Computer Interaction, Theoretical Computer Science or Visual Computing.

In your master's year you will choose to study a variety of cutting-edge modules in areas such as High Performance Computing (HPC) and Data Science.

UCAS CODE: G403
4 YEARS FULL TIME
TYPICAL OFFER: AAA – ABB

MEng COMPUTING

The MEng is a four-year integrated Master's degree aimed at the specific needs of advanced software development.

This degree is ideally suited to those students who are committed to a career in the software development industry. As an MEng Computing student, you will have the opportunity to learn about computer graphics, computer systems modelling, database systems and algorithms, in addition to software engineering modules.

Students will develop high level skills in software development, team working, planning, specification, design and risk analysis.

In your master's year you will choose to study a variety of industry standard modules in areas such as Security and Cyber-Physical Systems.

BSc APPLIED SOFTWARE ENGINEERING

The BSc in Applied Software Engineering is an innovative and flexible way for individuals to gain a degree in software engineering whilst in employment.

The course is open only to employees of regional companies and organisations, and is delivered on the University campus on Wednesdays from 1pm – 8pm throughout the full calendar year.

The programme has been designed with the support of an industrial advisory panel in order to meet existing skills gaps in industry. It covers the full breadth of software engineering, combining traditional academic teaching with work-based learning. 25% of the assessment is based on transferring academic knowledge to the workplace. Completion of the first two years of the programme offers the opportunity of being awarded an FdSc degree as an exit qualification, which itself is accredited under the Higher Apprenticeship Framework through Tech Partnership, the Sector Skills Council for IT.

FFION WILLIAMS

"Undertaking this course has significantly changed my life. I am now working as a Computer Science and ICT Teacher in a local secondary school."

YEAR IN INDUSTRY

G60A
BSc SOFTWARE ENGINEERING WITH A YEAR IN INDUSTRY
(4 years)

G847
MSci COMPUTER SCIENCE WITH A YEAR IN INDUSTRY
(5 years)

G40A
BSc COMPUTER SCIENCE WITH A YEAR IN INDUSTRY
(4 years)

G40B
MEng COMPUTING WITH A YEAR IN INDUSTRY
(5 years)

ACCREDITED DEGREE

ENTRY REQUIREMENTS:

AAB – BBB at A-Level (4 Years)
AAA – ABB at A-Level (5 Years)

Our Year In Industry Degree offers the opportunity for you to take an industrial placement in Year 3 to expand your knowledge of the sector and gain valuable industry experience while further developing the skills you have been taught.

Although securing a placement is the responsibility of the student, we work with a number of organisations who provide a range of placement opportunities. If you are unable to secure a placement by the end of the second year of your studies you will transfer onto the equivalent degree programme.

MEET STUART TOOMEY

Director of Employability, College of Science

Stuart offers support and guidance to all our Year in Industry students.

"The importance of gaining valuable core skills and life experience whilst at university has never been so critical. Today's employers are not just looking at your academic ability, but equally your wider skill set. We pride ourselves in providing you with every opportunity to develop your CV and build your employability skills alongside your academic studies."

My Year In Industry

ALEX CODEA

My placement is in Prague, Czech Republic, at Broadcom Inc, an American Company headquartered in San Jose, California. It is a very challenging environment, which is great. I am working as a software engineer, and am enjoying working on development projects.

The placement is great. I am living by myself in a one bedroom flat, which is quite cool at the age of 21!

Broadcom is a Fortune 500 company and the development work I undertake is usually for other giant tech companies or banks worldwide. The environment is super diverse and competitive, exactly what you need to develop your skills.

My advice is: go for it! It might be the best experience of your whole time at university. The people you meet and the companies which you can end up working and doing projects for are top class. Swansea University had a big impact on my placement so I would like to thank the Computer Science Department for that.

> **Swansea University is a great place to study. The lecturers are very supportive and the environment is very diverse. My Year in Industry gave me an insight into how the software industry really works, and I am very grateful for that.**

YEAR ABROAD

G40C
BSc COMPUTER SCIENCE WITH A YEAR ABROAD
AAB – BBB at A-Level
(4 year)

C60B
BSc SOFTWARE ENGINEERING WITH A YEAR ABROAD
AAB – BBB at A-Level
(4 year)

G4G2
MSci COMPUTER SCIENCE WITH A YEAR ABROAD
AAA – ABB at A-Level
(5 year)

G40D
MEng COMPUTING (WITH A YEAR ABROAD)
AAA – ABB at A-Level
(5 year)

On our Year Abroad schemes, you will get the opportunity to spend a year abroad at one of our partner institutions. This is a marvellous opportunity to experience a different culture and education system, gain an international perspective of the field of computer science, develop interpersonal skills and, depending on the destination, to improve your language skills.

Find out more: **www.swansea.ac.uk/international/opportunities**

Hassan Eshkiki

For my Year Abroad placement I am studying in Grenoble Universty near the Alps where the river Drac joins the Isère. This city is one of the largest scientific cities in Europe.

Spending my year abroad at Grenoble University has been amazing! I am really enjoying my time here, gaining new experiences in the multi-national environment every day while enjoying my studies. There is a great transportation system which is fast and cheap and I've travelled to explore Paris and Lyon. Paris is even more beautiful than in photos! I have plans to travel to Geneva as well. The University has many links with industry which helps us to find work after we graduate.

I love living here so much and feel so lucky to have this opportunity! In my spare time my friends and I play football, go bowling together and have lots of BBQs, in our garden right by the river.

With our student discount it makes going out much more affordable and gives us more time to enjoy the beautiful city of Grenoble.

GO BEYOND...

HACKATHON | GOOGLE HASH | GREENBOOK CLUB | SUCS | ANNUAL UNDERGRADUATE STUDENT COLLOQUIUM | MAKER COMPETITITON

SUCS

SUCS @ Swansea is one of the oldest societies at Swansea University and is the only society to have its own room open to all society members. Swansea University Computer Society is open to all members of the Students' Union.

We offer a wide range of computing services to our members, all based on Free Open Source Software (FOSS). Whether you're interested in learning more about Linux and Open Source software, or simply want an easy-to-remember email address and more space to store your coursework, SUCS is here to help!

GREGYNOG

Each year the Computer Science Department hold a colloquium at Gregynog, a large country mansion in Mid Wales.

Students taking the project module spend three days at the colloquium giving talks on the past, present and future of computer science.

MAKER COMPETITION

Want to change the world? Join us and enter our annual Maker Competition and show us how you see the future built, with physical computing elements such as Arduinos, Raspberry Pis and MaKey MaKey Kits. Form a team, work together and create something inspiring!

HACKATHON

Externally, our students get the chance to compete in national Hackathons run by organisations such as the NHS and BBC. In 2018, six of our computer science students attended the NHS Welsh Hackathon with the department contributing work to three winning teams who were given the opportunity to apply for government funding to further develop their ideas over the summer.

GOOGLE HASH CODE

Our Computer Science Department has been working with Google to ensure that we are teaching the skills that companies like Google need. We also run a series of events aimed at boosting our students' career prospects at leading global technology companies.

GREENBOOK CLUB

The Greenbook Club provides an opportunity for students to further their abilities in algorithmic thinking. These sessions initially started as a result of meetings at Google UK in London with Dr Daniel Archambault and Dr Liam O'Reilly in order to figure out how to encourage more Swansea graduates to apply to tech giants such as Google. The club gets its name from the colour of the 'Cracking the Coding Interview' book which is used to train students for coding interviews that are frequently used as part of the recruitment process at such companies. We also encourage and train for industrial programming competitions such as Google Hash Code **https://codingcompetitions.withgoogle.com/hashcode**

TOP 5
IN THE UK FOR
STUDENT SATISFACTION
WITH 94%
[National Student Survey 2017]

Graduate Profile

ELISHA RENDELL

1ST BSc COMPUTER SCIENCE
SOFTWARE ENGINEER, AIRBUS

"I was first introduced to computer science and programming during my A-levels. My teacher persuaded me to take it over ICT and I found it so rewarding and challenging. It was amazing to be able to create something usable from scratch.

I decided that computer science was the right path for me and came to a visit day at Swansea. I instantly felt a strong sense of community on the campus; halls and lecture theatres were all together in one place and everything I needed was within walking distance. The course at Swansea is amazing too, I found that other computer science courses were restrictive and aiming to get you into one career path, but the course at Swansea covers a broad area and equips you with the skills needed for a wide range of careers. I had the chance to choose more in-depth modules in my third year such as Mobile Apps and Web Application Development. My favourite module was Cryptography which was really interesting and allowed us to practice secure communication techniques.

For my third year project I looked at the use of Augmented Reality (AR) in education and compared it to current methods such as textbooks and lectures. I used a HoloLens, which is an augmented/mixed reality headset and really enjoyed demonstrating my project at open days and the annual project fair.

I graduated with 1st class honours, and since then I've been working in industry doing web development. As Airbus is very data driven I've also been learning a lot about databases, managing them and using SQL queries to extract and manipulate the data. It was a steep learning curve trying to apply all the theoretical knowledge I learnt throughout Uni into practice but it's been so rewarding."

Graduate profile

GENALYN ESTRADA

LEAD DEVELOPER

"I studied MEng Computing and graduated with first class honours. I currently work as a lead developer at 4C Consulting in London, which is a leading Platinum Salesforce Partner that specialises in building cloud applications.

I am really enjoying the pressure of working on multiple projects at once, it is often intense but after completing multiple dissertations at Swansea University, I feel that I am more than prepared for the job.

I received amazing support from the lecturers as well as other staff members! Everyone was friendly and went out of their way to help. Lecturers encouraged discussions, especially in relation to current events and how it may affect us as computer scientists.

It was fascinating learning about staff research, and how I could contribute or conduct similar research to answer difficult questions for myself. I really enjoyed the freedom the final year project provided to explore concepts that were not as thoroughly covered in the degree.

"You could say that my time at Swansea was super busy but I loved every minute of it."

I was a really shy person before attending Swansea University. The course encouraged lots of group work as well as communication and this really helped me come out of my shell. One dramatic change I noticed within myself was the ability to more confidently approach problems from new angles.

The university taught me how to deal with problems where the solution is not immediately obvious, which is a skill I use daily in my role as a developer. Swansea University really prepared me for industry and when I graduated I felt ready to take on new challenges.

During my studies I became a student ambassador and took on the responsibility of promoting and enhancing the reputation of the university to prospective students. I loved being an ambassador, it was so much fun to meet like-minded people and talk about my experiences with them!

I was also a Technocamps ambassador, where I helped children in primary and secondary schools learn about algorithms through teaching programming with the use of the LEGO Mindstorm robots. You could say that my time at Swansea was super busy but I loved every minute of it.”

> “During my course I was taught how to think like a software engineer, which has equipped me for my current role.”

WHAT'S IT LIKE TO BE AN IBMER?

CHRIS PARSONS,
MACHINE LEARNING ENGINEER, IBM

"I chose Swansea as it was a campus based university, which was very important to me. I loved having a common space where everyone could come together and study. Swansea University instantly felt homely and had a real sense of community.

The strength of the Computer Science Department was hugely important and this was obvious in the depth of the knowledge and expertise of lecturers. There is a huge range of topics on offer such Development and Computer Vision. These instantly got my attention and I felt as if not only would I qualify with a degree but also get some hands-on experience along the way. My favourite module was Logic for Computer Science; it really pushed me intellectually and gave me a grounding for the day-to-day challenges I now face within the business environment here at IBM.

> "I could not have done this without the support of the department, which has been absolutely invaluable."

It was during my 2nd year that I also got the chance to work as a Technocamps ambassador. This was a fantastic experience. I gained more skills and the team's support was amazing. I am still in regular contact with the team and Professor Faron Moller is one of my nominated referees on job applications. ITWales and Technocamps both got me thinking about work placements and so I decided to apply for a summer placement with GE (General Electric). The 2nd year lends itself to industry experience and the knowledge I built up enabled me to have the technical skills I needed for the role. This was a fantastic opportunity and I got loads ▶

> “The technical grounding I gained at Swansea University has allowed me to evolve and adapt to an ever changing industry, which has been essential! ”

of support from the Computer Science Department, which helped me with my CV and interview preparations. As part of my placement, I put all the theory I had learnt into practice and developed my own skills. I could not have done this without the support of the department, which has been absolutely invaluable.”

HOW TO GET TO IBM?

“Once I graduated, I applied to the IBM Graduate Scheme and got offered a permanent job on the Cognitive System Team. It felt amazing to be offered a role with IBM! I absolutely love my job; no day is ever the same as the role is always evolving! As part of my role, I have been building a community of practice, which involves people doing cool stuff with Artificial Intelligence on the IBM platform. We have rolled this out across Europe and now have 18 hubs in 12 countries with just over 5,000 members – all this within six months of development! To be a part of it is incredible and it all began at Swansea University.

I work closely with IBM business partners M7. We are building a Centre of Excellence for AI through the creation of collaborative hubs. I am also involved in Hackathons and we have been working closely with the NHS. These are usually run over two days and we work with graduates to solve problems whilst broadening awareness and trying to overcome challenges. The Hackathons are a great way to engage with the community and expand our reach even further.

I have the best job ever and I cannot imagine doing anything else!”

International Student Profile

NOTHANDO TSHUMA

2ND YEAR, BSc COMPUTER SCIENCE

"I had never been to the UK before I applied to Swansea University. I had never travelled to many places around the world, so, as you can imagine, coming to the UK was a pretty big deal for me.

One of the reasons I chose Swansea was for its cultural diversity. I saw it as an opportunity to meet people from different parts of the world, while getting to learn about other backgrounds and people's diverse experiences. I didn't get a chance to visit Swansea before enrolling, so all I had were the online student profiles, which were very helpful. One of the many great things I love about Swansea University is its geographical location. Swansea is a coastal area and the University is situated just minutes from the beach which is pretty cool considering there are no beaches in Zimbabwe!

Cultural diversity is very much appreciated by the university. This is shown by the amount of effort the university puts into welcoming students from different parts of the world. Dinners and lunches are hosted for international students and this is a great way to integrate people from all cultures. The department made me feel very welcome by assigning me to a 'buddy' who was to take me around the university with other new students to show us our way to lectures. This was such a big help and also meant that we didn't get lost! I was also assigned to a mentor that I could talk to about any problems I had and this really helped me settle quickly. I was made to feel immediately at home.

I am a computer science ambassador and also a student rep and it has been the BEST few months! Being a student rep has provided me with the opportunity to see for myself just how much the university appreciates students' input.

On the more social side, student reps get to attend socials where we get used to our job roles, get to participate in events such as survey promotions as well as organise study aid programmes during exam periods. I am also a member of the Computer Science Club for females as well as the Swansea University Christian Union so you could say that I like to keep myself busy.

Ever heard about culture shock? It is real but don't worry, the Swansea University family is very welcoming, and everyone understands that there are people coming from all over the world. So when you think 'University', keep thinking 'Swansea University!"

CAREERS

We work alongside the Swansea Employability Academy to ensure our students get the best support, advice and guidance to gain essential employability skills during their time at Swansea. You will leave Swansea University with much more than a degree. We lay the foundations for students to gain valuable industry experience both here in the UK and abroad.

We offer CV workshops and our Employment Zone advertises work placement programmes, part-time vacancies and graduate jobs. We take employability seriously and our employability statistics speak for themselves.

CAREER PROSPECTS

Graduates from our Computer Science Schemes enjoy rewarding careers with organisations such as IBM, Hewlett Packard, BT, Sony, Google, PWC, Motorola Solutions and HSBC.

In the past year, Google engineers visited Swansea University as they want to increase the number of job applications from Swansea graduates. They gave two lectures to our 2nd year students on topics such as 'How to pass your technical interview.'

The Computational Foundry has been designed to provide you with contacts with industry and businesses – you'll be working alongside SMEs who want to use your skills on live projects. When you graduate, you will have worked on solving real problems which are currently affecting businesses.

With job titles including senior software developer, systems developer, and software engineer, Computer Science at Swansea will prepare you with valuable core skills to successfully pursue a career within computing.

92%

In a professional or managerial job, or in further study

WITHIN 6 MONTHS OF GRADUATION

(DHLE 2016)

STRONG INDUSTRY LINKS

IBM

BT

Google

pwc

motorola

HSBC UK

ANNUAL PROJECT FAIR

Each year our final year computer science students complete a final year project as part of their degree. Working closely with academics, our students are able to present the results of their project to the public as well as to industry professionals. During the fair students are given the opportunity to network with visitors as well as showcase all their hard work.

There are also a number of student prizes awarded, including: 'Best student project voted by IT industry' and 'Best student project voted by academic staff'.

'MAKING AN ARCADE GAME WITH A CABINET'
Jacob Jones,
BSc Computer Science

VOTED BEST STUDENT PROJECT – BY IT INDUSTRY

10 Things YOU MUST DO

1. Eat Joe's Ice Cream
2. Paddle in Swansea Bay
3. Visit the National Waterfront Museum – one of many museums and galleries in the city
4. Surf down the Gower
5. Grab fish & chips at Mumbles Pier
6. Walk around our marina
7. Socialise with friends on Wind Street
8. Eat Welsh cakes at Swansea Market
9. Watch football, or the nation's favourite, rugby at the Liberty Stadium
10. Take in a show at the Grand Theatre

WHEREVER YOU GO IN SWANSEA...

you're by the sea

It's a beautiful location and a buzzing city; warm and friendly, it's compact, yet offers it all.

Swansea is as rich an environment for living as it is for learning. From its breath-taking sweep of award-winning beaches and coves to its dazzling nightlife, eclectic dining and unique shopping experiences, it's 378km^2 of everything you need to make your student experience amazing.

3RD MOST AFFORDABLE UK TOWN

(TotallyMoney.com 2018)

SWANSEA HAS AN ESTIMATED POPULATION OF

244,500

HOME OF THE GOWER
THE UK'S FIRST AREA OF OUTSTANDING NATURAL BEAUTY

STUDY AT Swansea

1 HOUR
FROM CARDIFF

2 HOURS
FROM BRISTOL

3 HOURS
FROM LONDON

3 HOURS
FROM BIRMINGHAM

STUDENT LIFE

The Bay Campus is situated in an outstanding location, on the eastern approach to Swansea, with direct access onto the beach and its own seafront promenade. At its heart is the Computational Foundry, designed to capitalise on our research expertise and collaborate with business and industry.

There is a full range of learning, recreational, social, eating and drinking facilities on campus, including:

- A beautifully designed library with views onto the dunes
- Extensive catering provision including cafes, bars and a dining hall
- A multi-purpose 800 seat auditorium, for events including concerts and exhibitions
- Retail facilities including a bank, mini-market and launderette
- Students' Union with social spaces
- Students' Union nursery
- Student support services
- Beach access and beautiful scenery
- Sports facilities including gym and outdoor playing areas

RUTH MEYCOCK

BSc COMPUTER SCIENCE WITH YEAR IN INDUSTRY

"During my first year I lived on Bay Campus, and I loved it! Living so close to lecture theatres means you can easily make it to lectures on time. Rooms in the residences are all spacious, modern, en-suite and self-catered. Each flat has a well equipped kitchen, which is also a great space for socialising with flat mates.

Common rooms around campus are open 24/7 for use of pool, foosball and table tennis tables. Some accommodation buildings have only finished being built in the last year so they all have a modern feel to them. But the best thing in my opinion about this campus is being able to walk straight onto the beach whenever you want. I don't know where else you would have that luxury!"

STAFF RESEARCH

EPSRC CENTRE FOR *Doctoral Training*

Your journey from undergraduate to postgraduate begins here at our EPSRC Centre for Doctoral Training.

Interested in all thing Big Data and AI? Our Centre for Doctoral Training is based within the Computational Foundry and our academic staff, Masters and PhD students are researching the human face of Big Data and AI and how it can be used to make the world a better place. You could join them after you graduate.

www.swansea.ac.uk/science/epsrc-centre-for-doctoral-training

FUTURE INTERACTION TECHNOLOGY LABORATORY (FITLAB)

(FIT Lab) is the College of Science's Human-Computer Interaction (HCI) group. The FIT Lab has since grown to become internationally recognised as a world-leading centre for HCI research; forging collaborations with industry partners such as Microsoft Research, Google, the BBC, IBM, Nokia, and the NHS.

The goal of the FIT Lab is to put people at the centre of technological innovation – to create platforms, devices and services that are not just functional, but usable, efficient and enjoyable. Much of our research involves working directly with end-users to study, plan, design and create new interactions appropriate for their contexts.

HCI is a multidisciplinary field that spans beyond computer science into areas including psychology, sociology, health, ethnography, design, human factors, engineering and linguistics; it therefore involves a significant number of collaborations with other disciplines within the university and beyond.

VISUAL AND INTERACTIVE COMPUTING

The Visual and Interactive Computing group has contributed a large collection of significant breakthroughs in the fields of Data Visualisation, Computer Vision, Data Mining, Artificial Intelligence, Visual Analytics, Data Science, Computer Graphics, Interaction and GPU programming.

The group follows an ambitious and curiosity-driven programme to develop new algorithms and methods, as well as advanced software techniques and tools for these areas. It has a number of on-going collaborative research projects with scientists from around the world and is actively involved in knowledge transfer and industrial applications.

TOP 15

in The UK

RESEARCH

[Times & Sunday Times University Guide 2019]

STAFF RESEARCH

SMART SPEAKER SYSTEMS IN PUBLIC AREAS IN INDIAN SLUMS

THE DIGITAL DIVIDE

Millions of homes worldwide enjoy access to digital content and services through smart speakers such as Amazon's Echo and Google's Home.

Promotional materials and users' own videos typically show homes that have many well-resourced rooms, with good power and data infrastructures. Over the last several years, we have been working with slum communities in India, whose dwellings are usually very compact (one or two rooms), personal home WiFi is almost unheard of, power infrastructures are far less robust, and financial resources put such smart speakers out of individual household reach.

Inspired by the "hole in the wall" internet-kiosk programme, we have designed and built two working smart-speaker systems and installed them within public areas and passageways in a large Indian slum.

These prototypes allowed passers-by to ask questions and receive either instant computerised answers or delayed human-curated answers.

Watch

Professor Matt Jones talk about smart speaker systems in Mumbai.

4 QUALITY EDUCATION

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

10 REDUCED INEQUALITIES

THE GLOBAL GOALS
For Sustainable Development

STAFF RESEARCH

Our ethos is to pursue research that matters in the long term, inspiring students and encouraging them to help change the world. We have one mission: to be a world leading centre for digital innovation.

SECURITY GROUP

Security in the context of computer science encompasses technical aspects such as the protection of our digital life from a variety of attacks, through to social aspects such as privacy and use of policies. Security is an area of computer science that continually affects our everyday lives.

Our Security group is particularly interested in rigorous analysis of the security of systems, covering aspects such as cryptography, information theory, formal methods, hardware design, protocols design, and human-centred design. Swansea staff have made contributions to the field in areas such as digital economy, cryptocurrencies, security and privacy of personal data, cyberterrorism and cyber-crime, and mobile security, to name but a few.

THEORETICAL COMPUTER SCIENCE

Theoretical Computer Science (TCS) uses mathematical and logical methods to understand the nature of computation and to solve fundamental problems arising through the everyday practical use of computer systems.

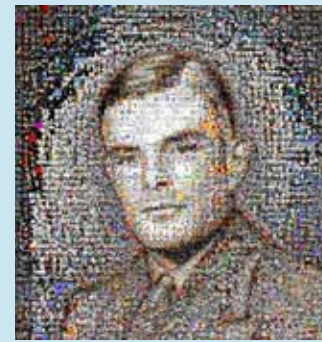
The Swansea Theory Group is internationally renowned for its research in Logic in Computer Science. Active research areas include: Computability Theory, Computational Complexity, Proof Theory, Type Theory, Game Theory, Concurrency, Artificial Intelligence (Satisfiability Solving, Multi-agent Systems, Argumentation Theory, Machine Learning, AI and Law), and Formal Methods (Cyber Security, Blockchain Technology, verification of Railway Control Systems).

ALAN TURING'S IMPACT ON SWANSEA'

Professor Arnold Beckmann
SURF Research as Art runner up

"The image shows a picture mosaic of Alan Turing, who in his short life made some very influential scientific contributions leading to the development of modern computers and computer science in particular. The mosaic is made out of hundreds of images reflecting research and activities of recent years where Swansea computer scientists have played a key role – these activities still have links to Alan Turing."

Find out more about research as art at Swansea
www.swansea.ac.uk/research-as-art



TCS owes much of its success to Alan Turing

COMPUTER SCIENCE COMMUNITY

Whether you are into coding, programming or software engineering we will have a course which suits you. We have a wide range of students from all around the world, all with one thing in common – a love for computing.

All students are treated equally and have access to the same teaching materials. The department organises a host of extra-curricular activities and we promote group collaboration, which unites students in their journey through Swansea University. We believe that all our graduates leave Swansea with not only a top quality degree but also important life skills and experiences.

The university also holds an Athena SWAN Silver Award.

Since 2000, ITWales – the industrial liaison unit of the Department – has organised an annual celebration of International Women's Day. The purpose of this event is to highlight the careers of successful women as a means to addressing the gender gap within ICT and computing industries.

Each year focuses on a different theme, with recent celebration taglines being "Inspiring the Next Generation," "Journeys of Discovery" and "Education and Achievement." Every year all of our female students are invited to be amongst the 200 attendees, listening to a range of inspiring speakers from across the UK and networking with others whilst celebrating Women in Welsh IT.

2020 marks the Twentieth Annual ITWales IWD Celebration, will you be part of it?

International Women's Day

Student Profile

OSIAN SMITH

2.1 BSc COMPUTER SCIENCE

"Coming into Swansea BSc Computer Science, I wasn't sure if university was right for me. I was diagnosed with dyslexia in school and was given a laptop to complete my schoolwork. This is where my curiosity in computing grew and I developed an interest in knowing how computers work, and how they can be used to help people – people like me!

Due to my dyslexia, I had no plans to do any further study once I left school, but I was inspired by a great IT teacher, who suggested I study IT BTEC at college. I absolutely loved college and from there applied to study computer science at Swansea and was made an offer on the BSc Computer Science degree.

I applied to Swansea because I loved the location, the campus is next to the beach and when I visited everyone was so welcoming that I felt at home very quickly. I didn't think I would get past Freshers' week, let alone pass first year, yet here I am halfway through my MRes in Computer Science. I'm working with the NHS, creating an app that tracks blood pressure and data on the causes of blood pressure change. I have had tons of opportunities being a student, from becoming a student ambassador to entering Hackathons, and working with industry partners such as Mishcon de Reya.

I've also met great friends and have been a member of several societies. Computer Science at Swansea is a great course, with a wide variety of modules, a wide range of people from all over the world and a great location. I love it here so much I am halfway through my MRes in Computer Science and have just found out I have been accepted for a PhD so will be staying here for another 3 years – I don't want to leave just yet!"

INTERNATIONAL STUDENTS & FOUNDATION YEARS @ THE COLLEGE

If you are an International (non-EU) student studying a Computer Science Foundation Year, your degree will begin at The College.

The College offers academic pathways at Swansea University that lead to undergraduate and postgraduate degrees. The College provides teaching in smaller groups, with a personalised and supportive educational philosophy. When you study at The College, you are a full student of the University from the start of your course.

All courses are available with a choice of start dates and durations, depending on your qualifications and English language proficiency.

The College has an all new purpose-built building located on the beachfront Bay Campus. There is a new 411-bed student residence just for the students of The College, also located on the Bay Campus.

Find out more: **www.swansea.ac.uk/the-college**

VISITING SWANSEA UNIVERSITY *and your offer*

It's really important that you make the right choice of university and course, and you can always contact us if you're worried things might not go according to plan.

After you've applied, you'll be invited to attend a Swansea University Open Day. You'll have the opportunity to speak with staff and students who can answer any questions you may have. Also, visiting us is a great way to get a taste of life here at Swansea University and get the chance to chat one-on-one with academic staff to discuss your offer or ask questions about the course itself.

We can be flexible with offers, so please get in touch to tell us about your personal circumstances.

NOT GOT THE GRADES?

Contact us if all doesn't go to plan and we will do our best to help.

Come see us!

BOOK NOW
www.swansea.ac.uk/open-days

SCHOLARSHIPS AND BURSARIES

Swansea University award a number of Excellence Scholarships to all UK students* who achieve AAA at A-Level (or equivalent) worth £3000 over three years; Merit Scholarships to all students who achieve AAB at A-Level (or equivalent) worth £2000 over three years.

Visit **www.swansea.ac.uk/scholarships** for the latest information and terms and conditions.

*EU students may also be eligible for these scholarships, please check the website for the latest information.

Key Dates
FOR YOUR APPLICATION

SEPTEMBER

UCAS applications open

OCT/NOV

Attend a Swansea University Open Day

JAN 15TH

UCAS application deadline
(although we will still accept applications after this date)

JAN – JUNE

More opportunities to visit the campus and make sure it's the right place for you

MAR – JUN

Apply for finance and accommodation

SEPTEMBER

Arrivals and welcome week!

REASONS TO STUDY AT

Swansea University

TEF Gold

THE TIMES THE SUNDAY TIMES GOOD UNIVERSITY GUIDE 2019

UNIVERSITY OF THE YEAR RUNNER-UP

THE TIMES THE SUNDAY TIMES GOOD UNIVERSITY GUIDE 2019

WELSH UNIVERSITY OF THE YEAR

UK TOP 10 GRADUATE PROSPECTS

(Destination of Leavers from Higher Education 2018)

UK TOP 30 RESEARCH EXCELLENCE

(REF 2014 – 2021)

5 Star

TEACHING EXCELLENCE

WHATUNI? STUDENT CHOICE Awards 2019

WINNER UNIVERSITY OF THE YEAR

WHATUNI? STUDENT CHOICE Awards 2019

WINNER INTERNATIONAL

UK TOP 30

(The Times and Sunday Times, Good University Guide 2019)

JARGON buster

When you apply to University you will come across terms you may not have come across before. We have attempted to take some of the worry away by producing a 'Jargon Buster' covering the most frequently used terms.

Adjustment: If your grades are better than expected and you exceed the conditions of your conditional offer, you can 'adjust' to an alternative place.

Change course offer: This can be offered by your university/college if you don't meet the entry requirements of your original choice.

Choice: This is also known as the course you apply for. UCAS allows you to initially apply for up to 5 courses.

Clearing: Clearing gives students the chance to look for a place on a course after 30 June, at any university or college if you haven't already had an offer of a place.

Conditional Offer: Congratulations, we have made you a conditional offer. This means that you have an offer of a place subject to meeting the conditions, which usually means achieving specific grades or tariff points in your exams.

Unconditional Offer: Congratulations, you have an unconditional offer. This means that you have a place with us!

Confirmation: The decision made by university or a college once examination results are received to accept or reject the application.

Deferral: This applies to students who want to start at a later date. UCAS will allow up to two deferrals before you have to re-apply.

Degree classification: When you graduate, you will get one of the following degree classifications: 1st, 2.i, 2.ii or 3rd.

Entry Requirements: These are the grades that we recommend students get to join our courses. Each course will have its own requirements. These can all be found on our website.

Firm Choice: This is your first choice university, so make sure you save this spot for Swansea!

Foundation Year: You can do a BSc degree with an intergrated foundation year if you don't meet the entry requirements for the the BSc course. This means you do an extra year at the beginning where your knowledge and skills will be brought up to the level you need to begin the BSc course.

Insurance Choice: This is your second choice university.

MSci and MEng: These are four-year courses which extend our three-year degrees in Computer Science and Software Engineering with an integrated master's year.

Track: This is the UCAS online tracking system where you can see the progress of your application.

UCAS: UCAS stands for Universities and Colleges Admissions Service. All UK applications go through UCAS.

Graduation: A ceremony held in the Great Hall at the Bay Campus that you take part in when you finish your degree.

Undergraduate: All first degrees (i.e. BSc) are known as undergraduate degrees.

Undergrad: When you start university, you may be referred to as an undergrad while you are studying an undergraduate degree.

Postgraduate: This applies to all courses studied after an undergraduate degree. A list of our Computer Science postgraduate courses can be found here: **swansea.ac.uk/compsci/postgraduate**

BSc: An undergraduate academic degree known as a Bachelor of Science. When you graduate you will be awarded a BSc in your subject.

IMPORTANT INFORMATION – PLEASE READ

The following message contains some very important information. Please read it before you use this brochure.

This brochure was printed in the Spring of 2019. It contains information on the undergraduate programmes in Computer Science that Swansea University intends to run for students who are planning to start university in the Autumn of 2020.

We have made every reasonable effort to ensure that the information provided is both helpful and accurate as at the date of publication. However, some changes, for example to programmes, study location, placement opportunity, facilities or fees may become necessary due to legitimate staffing, financial, regulatory and academic reasons.

We will endeavour at all times to keep any changes to a minimum and to keep prospective students informed appropriately. Any changes to the information contained in this brochure will be updated quarterly at: **www.swansea.ac.uk/undergraduate-programme-changes** and on the online course pages at: **www.swansea.ac.uk/compsci/undergraduate**

COLLEGE OF SCIENCE
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Swansea University,
SA1 8EN Wales, UK

Telephone: +44 (0)1792 295111
Email: study@swansea.ac.uk

For UK admissions information please email:
admissions@swansea.ac.uk

For international admissions information please email:
international.admissions@swansea.ac.uk

FOLLOW US

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1920~2020

Swansea University
Prifysgol Abertawe

swansea.ac.uk/compsci