Department of Electrical and Electronic Engineering

Undergraduate Applicant Day

Dr David Carey, Head of Department
Dr Radu Sporea, UG Admissions Tutor
• Electrical, Electronic and Computer (E, E & C) Engineering: Where **Science + Engineering + Creativity meet**

• Our Degree Programmes – **What’s distinctive about Surrey**

• Every graduate has a degree. **What will make you different?**

• **Student and Department Success**

• **Bursaries and Scholarships**
Recent success in the department’s research

CVSSP – facial recognition AI

ATI - graphene and advanced nanoelectronics

£29 million space hub

5G - controlled and autonomous vehicle demonstration
What we do: 5G Innovation Centre (5GIC)

Mobile and wireless communications

The largest international research Centre of Excellence in new generation mobile technologies and Internet of Things (£70m+ investment); in healthcare & dementia care, data and cyber security, and autonomous vehicles
Applications of our research
- All aspect of nanoscience and nanotechnology
- Graphene and new materials
- Energy production and storage
- Solar cells & batteries
- Printable & plastic electronics
- UK Facility for Ion Implantation
What we do: Surrey Space Centre

» Space engineering & remove debris

Applications of our research

- Surrey has pioneered the manufacture of small scale satellites, Galileo project
- Space robotics and vehicles
- Satellite remote sensing & disaster monitoring
- Autonomy and control systems
- RemoveDEBRIS from space
What we do: Vision, Speech and Signal Processing

» AI, machine learning & robotics

Applications of our research

- Computer vision & graphics
- Pattern recognition
- 4K video and audio
- Machine learning and AI
- Biometrics & security
- Digital signal processing
- Media content and streaming
- Medical imaging
- Robotics

Google Landmark Retrieval Challenge 2018 winner
Student Success

- **Abdullah Al-Shakarchi and James Telfer (On placement)**
- Winners, Santander Big Ideas Challenge (most other entries were MSc / PhD students)
- **Encord**: Voice capture for automatic data entry for customer – advisor conversations. Example of AI in action

- **James Lynn (2nd year UG)**
- 2016 NASA Space Apps Challenge
  - Best Use of Hardware in NASA’s Space Apps Challenge 2016
- **Canaria**: CO₂ monitor patch and ear piece based on low energy Bluetooth
Student Involvement - Your Department

• **EARS – Electronics and Amateur Radio Society**
  Events, challenges, competitions
  Manage the **Makerspace** – chance to visit during lab tour

• **Support for HackSurrey society**

• **Student enterprise**
  Studio – a place for your business
  Hub – presentation and meeting
  Mentoring; Business Engagement

• **Women in Engineering Society**
  Faculty-wide group

• **Equality and Diversity**
  Athena SWAN Bronze Award - recognising advancement of gender equality: representation, progression and success for all.
EARS – ScraphEEp Challenge 2019
Choosing Your Degree – Opportunities

- Electronics and Nanotechnology
- Electrical, Power and Energy
- Computer and Internet Engineering
- Space & Satellite Engineering
- Robotics and AI, Machine Learning
- Communications, mobile & wireless Engineering
Choosing your Degree – Structure

Key point 1: First year is common to all BEng and MEng degrees

- Electronic Engineering (EE)
- Electrical and Electronic Engineering (EEE)
- Computer and Internet Engineering (CIE)
- Electronic Engineering with Computer Systems
- Electronic Engineering with Nanotechnology
- Electronic Engineering with Space Systems

Our core degree programme

Degrees with a specialised title but a narrower choice of modules
MEng is a higher undergraduate qualification than BEng (Hons)

- MEng (four academic years) with more specialist modules
- Qualification of choice of many employers and industries
- Faster Route to CEng status which applies across ALL branches of engineering

**Key point 2: Transfer between BEng and MEng possible** subject to performance.

**Key point 3: MEng guarantee:** If you apply for a MEng degree but meet the BEng admissions criteria you will be automatically be offered (in August) admission to the BEng programme.
<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2 or study overseas</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Logic + intro to Programming (Python)</td>
<td>Computer Algorithms and Architecture</td>
<td>Individual Project</td>
<td>(MEng) Multidisciplinary Engineering Design Project</td>
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<tr>
<td>Electronic Circuits</td>
<td>Circuits, Control and Comms</td>
<td>Group Project</td>
<td>Module choice</td>
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<tr>
<td>Pure Mathematics</td>
<td>Further Engineering Mathematics</td>
<td>Module choice</td>
<td>Module choice</td>
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<tr>
<td>Labs, Design and Professional Studies I</td>
<td>Labs, Design and Professional Studies II</td>
<td>Labs, Design and Professional Studies III</td>
<td>Labs, Design and Professional Studies IV</td>
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<td>Small group tutorials with Personal Tutor</td>
<td>Small group tutorials with Personal Tutor</td>
<td>Small group tutorials with Personal Tutor</td>
<td>Small group tutorials with Personal Tutor</td>
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<table>
<thead>
<tr>
<th>Year 2 or study overseas</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming in C</td>
<td>Group Project</td>
<td>Module choice</td>
</tr>
<tr>
<td>Electrical Science I</td>
<td>Module choice</td>
<td>Module choice</td>
</tr>
<tr>
<td>Engineering Mathematics</td>
<td>Module choice</td>
<td>Module choice</td>
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<tr>
<td>Labs, Design and Professional Studies I</td>
<td>Labs, Design and Professional Studies II</td>
<td>Labs, Design and Professional Studies III</td>
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Professional Training Year (PTY) – Paid Year in Industry - Support from Careers and Employability Service & during Year 2

* Modules subject to change
Year one – typical schedule

<table>
<thead>
<tr>
<th>Day</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 am</td>
<td>Lecture</td>
<td>(Extra Maths)</td>
<td>Lecture</td>
<td>(Extra Maths)</td>
<td>Lecture</td>
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<tr>
<td>10 am</td>
<td>Lecture</td>
<td>Lecture</td>
<td>Lecture</td>
<td>Lecture</td>
<td>Lecture</td>
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<tr>
<td>11 am</td>
<td>Lecture</td>
<td>Lecture</td>
<td>Lecture</td>
<td>Lecture</td>
<td>Lecture</td>
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<tr>
<td>12 pm</td>
<td>Lecture</td>
<td>Lecture</td>
<td>Lecture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 pm</td>
<td></td>
<td></td>
<td></td>
<td>Group</td>
<td></td>
</tr>
<tr>
<td>2 pm</td>
<td>Labs</td>
<td>Labs</td>
<td>Private</td>
<td>Tutorials</td>
<td>Tutorial</td>
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<tr>
<td>3 pm</td>
<td>Labs</td>
<td>Labs</td>
<td>Study</td>
<td>Programming</td>
<td></td>
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<tr>
<td>4 pm</td>
<td>Labs</td>
<td>Labs</td>
<td>or</td>
<td>Programming</td>
<td></td>
</tr>
<tr>
<td>5 pm</td>
<td>DPS</td>
<td>Sports</td>
<td>Lecture</td>
<td></td>
<td></td>
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- 25 timetabled contact hours per week = Engineering theory (13 hours lectures) + 8 hours of practical labs
- Small group tutorials with your personal tutor + Design and Professional Studies (DPS)
Year two – option to study abroad

Key point 4: Opportunity to study abroad in year two

- Australia-La Trobe University
- Australia-Swinburne University of Technology
- Korea, Republic of-Seoul National University
- Australia-University of Sydney
- Australia-University of Wollongong
- Malaysia-Universiti Malaya (UM)
- New Zealand-Victoria University of Wellington
- United States-California State University, Los Angeles
- United States-University of Central Florida
- United States-University of North Texas
- United States-North Carolina State University
- United States-University of Cincinnati
Year in Industry – between Years 2 and 3

- Optional 12 month placement in industry (UK or overseas).
- Often results in job offers, sponsorship, a network of contacts & improved academic performance.

**Key point 5: The Year in Industry is optional; final decision in Year 2**

Sony  ARM  BBC  SSTL
Sharp  Logica  Thales  Astrium
Philips  NEC  EA  ESA
Canon  Lucent  Dolby  Goldi
Mitsubishi  Motorola  Microsoft  Pulse Structural
Hewlett Packard  Nortel  FrameStore  Radio Tactics
BAe Systems  Tactiq Ltd  Thomson  EMEA (Madrid)
Siemens  Ericsson  Vicon  Airbus
Ultra Electronics  BT  Snell & Wilcox  Renesas
Tyco Electronics  IBM  Stemmer Imaging  EnOcean
EDF  Nokia  Pharos  AWE
National Instruments  Bytronic  Focsuite  Hawk-Eye Innovations
Qualcomm  EDA Solutions  Forsenic Telecoms
General Electric  Intel  Sky TV
GE Healthcare  Jaguar Landrover  McLaren Applied Technologies

“Every graduate has a degree” – What makes you different?
Year in Industry – between Years 2 and 3

The UK Electronics industry

- is worth £23 billion a year
- fifth largest in the world
- employs over 250,000 people
- home to over 40 per cent of Europe's independent electronic design community
- Majority based in the South East region

Source: National Microelectronics Institute
Surrey’s work placements and research partnerships ranked best in the UK by QS World Employability Rankings

QS World Employability Rankings 2019 have ranked the University of Surrey 1st in the UK and 7th in the world for work placements and research partnerships with employers.
Year three – research project
Choosing your University – TEF

- **Teaching Excellence Framework (TEF)** aims to “recognise and reward excellence in teaching and learning, and help inform prospective student choices within higher education”.

- **Institutions graded as Gold, Silver, Bronze or given provisional status.**

- **Gold** - provision is consistently outstanding and of the highest quality found in the UK Higher Education sector. (Gold status awarded to 59 institutions)

- **Silver** - provision is of high quality, and significantly and consistently exceeds the baseline quality threshold expected of UK HE (116 institutions)

- **Bronze** - provision is of satisfactory quality (56 institutions)

- **Surrey Awarded Gold status**
Choosing your University – student focus

» Sustained Excellence in Teaching & Student Experience and Satisfaction

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<tbody>
<tr>
<td><strong>2020</strong></td>
<td><strong>Institution</strong></td>
<td><strong>Guardian score /100</strong></td>
</tr>
<tr>
<td>1</td>
<td>Nottingham</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Surrey</td>
<td>94.1</td>
</tr>
<tr>
<td>3</td>
<td>Loughborough</td>
<td>90.6</td>
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<tr>
<td>4</td>
<td>Leeds</td>
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<td>5</td>
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<tr>
<td>7</td>
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<td>8</td>
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<tr>
<td>10</td>
<td>Hertfordshire</td>
<td>78.8</td>
</tr>
</tbody>
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Award-winning facilities

Open 24hrs 365 days
Digital Resources
Hive (campus support centre)
SurreyLearn virtual learning
Workshops
Additional Learning Support
Opportunities at Surrey

- Professional placement
- 66% Students go on Placement (2016/17)
- Global Graduate Award
- 30%+ receive job offer from placement (PTV Survey)
- Study Abroad
- Research Placements
Over societies and clubs
Accommodation
Excellence in Electrical, Electronic and Computer Engineering

✓ Imaginative and exciting curriculum covering all aspects of modern electrical, electronic and computer engineering at BEng and MEng levels

✓ Recognised and consistent levels of excellence in Research and Teaching with a high degree of flexibility
  - Opportunity to change between BEng and MEng possible based upon results
  - MEng guarantee for admission
  - Opportunity to change degree programme into 2nd Year and tailor your module options
  - Opportunity to undergo Professional Year in Industry or study overseas

✓ Excellent degree and graduate career prospects