

Master of Science (MSc) Mobile Communications and Smart Networking

Next Generation Wireless (NGW) School of Electronics and Computer Science (ECS) University of Southampton Southampton, SO17 1BJ, United Kingdom

Wireless communications has played a key role in creating the world as we know it, with its enormous social and economic impact. In the near-future, it is expected that everything will be connected and hence, there is a need for more wireless engineers with advanced skills to design the future wireless networks. These future wireless networks will have to support and intelligently manage a massive number of Internet of Things (IoT) devices in real-time, within a highly dynamic environment.

The MSc Mobile Communications and Smart Networking programme prepares students to become capable engineers with in-depth knowledge and understanding of the theoretical and practical applications, which involve generating, transmitting and processing signals as well as designing networks. You will gain advanced knowledge in areas such as wireless transceiver design, network optimization, fundamental and advanced signal processing methods, as well as machine learning aided wireless communications.

Having successfully completed this programme, you will be able to

- demonstrate knowledge and understanding of the scientific and technological principles of wireless communications & intelligent networks;
- directly employ your skills to analyse mobile communications networks;
- exploit your knowledge in industrial design or to carry out in-depth research.

Under the auspices of our MSc programme, we have successfully graduated over 600 students, who are now making their mark playing key roles in both industry and academia worldwide.

Programme Structure

This is a full-time programme taught over one academic year, which consists of eight taught modules, complemented by a three-month project in Semester 3.

Taught Modules

The programme consists of some compulsory and some optional modules, allowing students to tailor the structure to suit their individual interests. These are some examples of the taught modules.

- Digital Coding and Transmission
- Wireless Transceiver Design and Implementation
- Simulation of Mobile Communications
- Signal Processing
- Wireless and Mobile Networks
- Advanced Wireless Communications Networks and Systems
- Future Wireless Techniques
- Machine Learning for Wireless Communications
- Advanced Systems and Signal Processing

Career Opportunities

MSc Mobile Communications and Smart Networking provides an excellent platform for further research in either industry or academia. Graduates of our MSc programme are employed worldwide in leading companies at the forefront of technology. Furthermore, the School of ECS

runs a dedicated careers hub which is affiliated with over 100 renowned companies like IBM, ARM, Microsoft Research, Imagination Technologies, Huawei, Nvidia, Samsung and Google, just to name a few.

School of ECS

The School of Electronics and Computer Science (ECS) at the University of Southampton, which was one of the first departments of its kind in the world, was founded in 1946 by Professor **Erich Zepler**, the pioneering contributor to radio receiver development. Today ECS is the UK's largest research grouping in the area, with around 250 academic and research staff, 270 PhD students and over 300 MSc students. Excellent facilities, key partnerships with major industries and a world-leading research base ensure that studying with us is productive, challenging and enjoyable - it would set you on the road to future success.

NGW has been consistently the highest-rated team in Telecommunications in Europe as listed by the prestigious Shanghai Ranking:

www.shanghairanking.com/rankings/gras/2024/RS0206



Next Generation Wireless (NGW)

This MSc programme is taught by the world-leading professionals of the Next Generation Wireless team (www.wireless.ecs.soton.ac.uk/). The NGW team has played a key role in advancing wireless communications since the early 1980s. Its research spans a rich spectrum of diverse areas in RF and optical wireless communications, classic and quantum signal processing as well as wireless networking. The group has been actively involved in the research of all prior generations of mobile communications systems, and has made well-recognised contributions both to long-term communications theory as well as to industrial implementations.

The NGW team is the top-ranked university research team for Telecommunication Engineering in Europe according to the ShanghaiRanking's Global Ranking of Academic Subjects.

Academics in NGW



Prof. Lajos Hanzo is the Head of NGW. He received Honorary Doctorates from the Technical University of Budapest (2009) and Edinburgh University (2015). He is a Foreign Member of the Hungarian Science-Academy, Fellow of the Royal Academy of Engineering, of the IEEE, of the IET and of EURASIP. (www.ecs.soton.ac.uk/people/lh)



Dr. Abdulkadir Çelik is an Associate Prof. During 2020 - 2025 he was with King Abdullah University of Science and Technology (KAUST), Thuwal, KSA. Dr. Çelik is the recipient of IEEE Communications Society's 2023 Outstanding Young Researcher Award for Europe, Middle East, and Africa (EMEA) region. Currently he holds numerous IEEE editorial roles. His research interests are in the broad areas of next-generation wireless communication systems and networks. (www.soton.ac.uk/people/661lwj/doctor-abdulkadir-celik)



Prof. Sheng Chen (FREng, FIEEE, FIET, CEng, DSc, PhD, BEng) has had a 35-year distinguished academic career in the UK. Since 1999, he has been with the ECS. In March 2004, Prof. Chen was named an ISI (Institute for Scientific Information) highly cited researcher in engineering. He was elected to a Fellow of the Royal Academy of Engineering of the UK in 2014. (users.ecs.soton.ac.uk/sqc)



Prof. Mohammed El-Hajjar worked as a design engineering in Imagination Technologies between 2008 and 2012 before joining the University of Southampton. He is the MSc Director of Programmes. His research focuses on signal processing for wireless communications. (www.ecs.soton.ac.uk/people/meh)



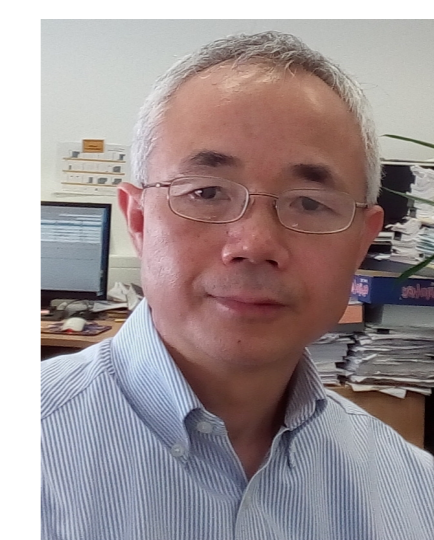
Prof. Robert G. Maunder has studied with the University of Southampton since 2000. His research interests include the joint design of signal processing algorithms and their practical implementation. He is the CTO of AccelerComm, a spin-out company that he founded in 2016 to commercialise his research. AccelerComm provides software and firmware to implement 5G base stations on satellites, with technology deployed into more than 100 satellites in orbit today. He is an active participant in the standardisation of 5G and 6G. (www.ecs.soton.ac.uk/people/rm)



Prof. Soon Xin Ng (Michael) received the Ph.D. degree in telecommunications from the University of Southampton in 2002. His research focuses on advanced transceiver design for both classical and quantum communications in next-generation communication systems, and he has published extensively in these fields. (www.ecs.soton.ac.uk/people/sxn)



Dr. Chao Xu (S'09-M'14-SM'19) is a Senior Lecturer. He received numerous career awards, most recently the Marie Skłodowska-Curie Actions (MSCA) Global Postdoctoral Fellowships with the highest evaluation score of 100/100. His research interests include index modulation, reconfigurable intelligent surfaces, noncoherent detection, turbo detection and quantum communications. (www.soton.ac.uk/people/5xd9xj/doctor-chao-xu)



Prof. Lie-Liang Yang (PhD, FIEEE, FIET, Distinguished Lecturer of IEEE VTS) acted as the leader of this MSc program for more than 10 year. He has 30+ years of research and academic experience, with research interests including wireless communications, signal processing for wireless communications and molecular communications. He has published 4 research books and 450+ research papers. (www.ecs.soton.ac.uk/people/lly)

Contacts/Links for Further Information

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Application: [MSc Mobile Communications and Smart Networking Next Generation Wireless: www.wireless.ecs.soton.ac.uk](http://www.wireless.ecs.soton.ac.uk)
School of ECS: www.ecs.soton.ac.uk
University of Southampton: www.southampton.ac.uk

Application: <https://www.soton.ac.uk/courses/mobile-communications-smart-networking-masters-msc>