wray castle

Empowering the telecoms world

Flexible, customizable, effective learning solutions for the global telecoms industry:

- 5G Technology
- Essential Technologies
- LTE/4G
- UMTS & HSPA
- GSM & GPRS
- IMS & SIP
- Radio Engineering
- ORAN
- Professional Mobile Radio
- Telecoms Business

Classroom | Live Virtual Classroom | On-Demand Online

www.wraycastle.com

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Introduction to Wray Castle

Empowering the Telecoms World

We empower the global telecoms world by providing the specialised knowledge, skills, and competencies required by organisations to build, manage, optimise, and operate cutting-edge telecommunications networks.

Proven **learning interventions** help organisations increase online learning completion rates by **70%**

Trusted by the global telecoms industry since 1958, we've helped upskill over 300,000 industry professionals from over 85 countries worldwide. Our learners come from many major mobile and fixed operators, vendors, regulators, consultants, rail operators, energy suppliers and government organisations.

Our Expertise

Our team of highly experienced specialist course developers and instructors come with decades of experience from within the industry and as specialist technical trainers.

We support learners at all stages of their career from new entrants looking for a thorough grounding in industry to experienced engineers looking to enhance their knowledge of the latest network technologies.

"By 2030: Skills shortage of 4.3 million workers in TMT Sector and unrealized output of $449.70 billion."
The Global Talent Crunch, Korn Ferry

Our courses cover all the major global communications technologies including:

- 5G Technology
- Essential Technologies
- LTE/4G
- UMTS & HSPA
- GSM & GPRS
- IMS & SIP
- Radio Engineering
- ORAN
- Professional Mobile Radio
- Telecoms Business

"…effortless delivery, reminded me how hard it is to do training really well. I found your enthusiasm for the subject infectious." **Vodafone**

"A very good course. This has given me a solid foundation in the telecommunication industry allowing me to be more effective in my new role." **Huawei**

"One of the best pieces of instruction I have received in over 20 years of military experience." **MOD**

Ofcom making communications work for everyone · BT · Telefónica · ATKINS · NetworkRail · vodafone · GCHQ

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Training Delivery Formats

Our blended training approach is adaptable and customizable, resulting in an engaging, effective learning experience.

1. Instructor-led Face-to-Face Training Courses:

Our classroom courses by true subject matter experts, uses a range of learning techniques to bring your programme to life including exercises, demonstrations, and role-playing.

- Train at your premises or at a premier venue globally
- Live training with on-the-spot feedback
- Ideally suited for delivering complex or detailed information to groups

2. Instructor-led Virtual Live Training Courses:

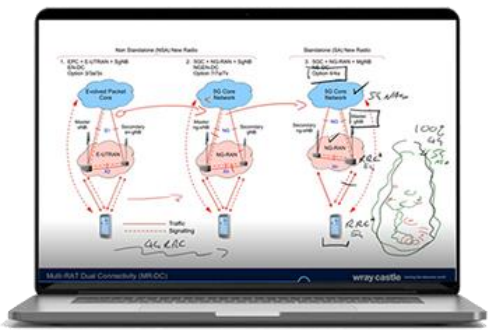
Live online classes reach participants globally with the same interactive learning experience as classroom training. Our trainers have delivered thousands of hours of live virtual training are skilled at utilising a range of techniques to ensure learners remain engaged throughout.

- Train staff across multiple locations, minimise downtime and travel costs
- Live training featuring engaging collaboration techniques.

3. Self-Paced Online Training Courses

Learn online, anytime, with our self-study courses. Our self-paced on-demand distance learning courses include an extensive blend of core reading materials and video resources, scenario-based assignments, a dedicated Instructor all in a modern, intuitive and secure cross-device Virtual Learning Environment.

Each course includes:



- **Illustrated Course Books** - featuring leading edge knowledge from subject matter experts.
- **Videos** - Detailed videos expand on the subject and discuss topics in greater depth.
- **Tutor Support** – Tutors are available to answer any questions throughout your studies.
- **Formative Assessment** - Modules include regular quizzes to support learning by testing your knowledge of the subject matter.
- **Digital Certification** - Successfully complete the end of module tests to earn Digital Badges to demonstrate the depth of your knowledge.

4. Tech Talks

Our growing collection of 2-3 hour technology briefings provide knowledge on the key technologies and the factors influencing strategic decisions in the telecoms sector.

5. Digital Course Books

Our diverse course portfolio is tailored to the needs of today's network engineers, our books include custom technical diagrams created by our subject matter experts.

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Customised Online Academy

Our customised Online Learning Academies are designed and customised for each client, meaning that every Academy is unique. Our proven platform combined with our Gold Standard training material effectively enables knowledge transfer and upskills staff across an organisation. We empower industry giants to fill their skills gap and develop, retain and attract the industries best talent and ensure they stay at the leading edge of the industry.

Each Academy help address the skills gap and delivers effective integrated training programmes that truly engage employees in their own development, whether its new starters, identified talent or experienced engineers. We help organisations empower employees to reach their potential and delivers a true return on your training investment.

Each customised Academy features:

- Robust, secure, feature heavy learning platform
- Flexible, blended learning formats to maximise employee engagement and learning across an organisation
- The widest range of specialist telecoms technology and business training courses.
- Best in class training content delivered by subject matter experts
- Regular and ad hoc learner analytics enable organisations to monitor employee progress, plan learning interventions and reward your top learners

Flexible Training Formats		**On-Demand Online Content**	
Executive Briefings	✓	Training Videos	✓
Self-Paced Online Learning	✓	English Delivery	✓
Access to Public Live Virtual Training	✓	Human Verified English Subtitles	✓
Customised Live Training Courses	✓	Other Language Subtitles	Option
Learner Platform		Course Books/Notes	✓
Scalable Enterprise Platform	✓	Tutor Support	✓
Fast Roll Out/Customization	✓	Self-Assessment Tests	✓
24/7 Access	✓	Certification Badges	✓
Computer/Tablet/Smartphone	✓	**L&D Admin Platform**	
Host Clients Content	✓	Learner Management	✓
Salesforce Security Rating - Excellent	✓	Ad Hoc Reporting	✓

Trial Academy Offer

Want to learn more?

If you'd like more information on Wray Castle's Online Academy solution. Contact us to discuss a limited seat trial Academy so you can see for yourself how the Academy can help you organisation execute your training projects and start to address the skills gap. Email us on info@wraycastle.com.

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Certificate & Diploma in Telecoms

Become a certified expert in Cellular Radio Engineering, Core Network Engineering, LTE or 5G Engineering with our Certificate and Diploma level training programmes. We have combined some of our most popular training courses to build guided learning pathways enabling you to demonstrate your expertise and competence in your chosen field.

Certified Training Programme Format

Certificate programme students' study the three foundation courses plus two specialist courses. The Diploma level programme allowing you to widen your knowledge base, by selecting an additional two courses from a portfolio of over 15 leading Wray Castle courses.

What specialisms are available?

- **Cellular Radio Engineering** (Specialist Courses: LTE Air Interface, 5G Air Interface)
- **Core Network Engineering** (Specialist Courses: LTE EPC, 5G Architecture and Protocols)
- **LTE Engineering** (Specialist Courses: LTE Air Interface, LTE EPC)
- **5G Engineering** (Specialist Courses: 5G Air Interface, 5G Architecture and Protocols)

Who would benefit?

Our Certificate and Diploma programmes have been designed for anyone working within the telecoms industry from new starters looking to build their technical knowledge from the ground up to more experienced managers and engineers looking to formalise and expand their knowledge base.

What sets our certified training programmes apart?

- **Focused Learning Pathways** – enable you to become an expert in your chosen field.
- **Flexible Learning** – study at a time, location and pace of your choice.
- **Full Tutor Support** – from industry experts with decades of experience.
- **Extended Learning** – Diploma students' study 3 additional courses.
- **24 months access** – access to the all the training materials for 2 years.
- **Regular Testing and Digital Badges** – allow you to demonstrate your knowledge.
- **End of Programme Certificate** – students successfully completing the programme are issued with a certificate complete with a grade transcript.

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Live Instructor-led Training

Classroom or Live Virtual Classroom

Essential Technologies	Level	Duration	Code	5G & Connected Innovation	Level	Duration	On-Demand
Telecoms - Today & Tomorrow	1	1	WR1402	5G Air Interface	3	2	FG1714
Telecoms Fundamentals	1	3	WR1701	5G Air Interface Overview	2	1	FG1702
2G to 5G Mobile Technologies	2	2	MB1101	5G Architecture and Protocols	3	2	FG1715
Machine to Machine (M2M)	2	2	WR1403	5G Architecture and Protocols Overview	2	1	FG1713
Wi-Fi Engineering Overview	2	2	WR1501	5G Cell Planning	3	2	FG2001
Introduction to Telecoms	2	3	TY2600	5G Engineering	2	2	FG1704
eSIM Engineering	3	2	WR1901	5G Engineering Overview	2	1	FG1703
Mobile Intelligent Networks (CAMEL)	3	2	MB90	5G Infrastructure & Operation	3	3	FG1902
Next Generation Transmission	3	3	TY2702	5G Network Slicing	3	1	FG1904
SS7 Engineering	3	3	QS2500	5G Radio Access Network	3	2	FG2001
Professional Mobile Radio	**Level**	**Duration**	**Code**	5G Security	3	1	FG1901
TETRA System Overview	2	2	TR1202	5G Service Based Architecture & Core Network	3	2	FG1903
TETRA Direct Mode Operation	3	1	TR1203	5G Technology, Services and Markets	1	1	FG1701
TETRA Security	3	1	TR1301	Mobile Edge Computing (MEC)	3	2	FG2101
DMR System Design	3	2	PR1302	**LTE**	**Level**	**Duration**	**Code**
TETRA Air Interface	3	2	MB2301	LTE Carrier Aggregation	2	0.5	LT1603
TETRA System Design	3	2	TR1202	Machine Type Communications for LTE	2	0.5	WR1702
Radio Engineering	**Level**	**Duration**	**Code**	Self-Organizing Networks Techniques for LTE	2	0.5	LT1501
Open Radio Access Networks (ORAN)	2	0.5	RP2001	LTE Backhaul Planning	2	1	LT1312
Principles of Radio Site Engineering	2	2	RP2100	LTE Engineering	2	2	LT3600
Radio Principles	2	3	RP1301	LTE Mission Critical Communications	2	2	LT1604
Radio System Design	2	3	RP1101	Small Cells Engineering Overview	2	2	LT1311
IP Microwave & E Band Planning	3	0.5	RP1306	Cell Planning for LTE Networks	3	2	LT2901
Microwave Link Planning	3	3	RP1601	Mobile Backhaul for 3G & 4G Networks	2	2	TY1201
Network Virtualisation	**Level**	**Duration**	**Code**	Single RAN	2	1	LT1203
Cloud Computing	1	1	WR1201	LTE Optimization	3	2	LT1001
NFV Overview	2	1	IP2102	LTE Radio Access Network	3	2	LT3603
Software Defined Networking (SDN)	2	1	IP1502	LTE Air Interface	3	3	LT3602
Network Functions Virtualisation Engineering	2	2	**IP1602**	LTE Backhaul	2	1	LT1202
SDN & NFV	2	2	IP1603	LTE Quality of Service	2	1	LT1314
Rail Communications	**Level**	**Duration**	**Code**	LTE Billing and Charging	3	0.5	LT1316
GSM-R Engineering Overview	2	2	MB2803	LTE Security	3	0.5	LT1303
FRMCS - Future Railway Mobile Communications System	2	2	MB2020	LTE Evolved Packet Core Network	3	3	LT3604
ERTMS-ETCS for Radio Engineers	3	3	MB1802	LTE End-to-End Signalling	3	2	LT1301
				LTE Voice - VoLTE	3	2	LT1002
				2G to 4G Indoor Coverage Planning	3	3	MB1304

IP Engineering	Level	Duration	Code	IMS & SIP	Level	Duration	Code
Internetworking, Ethernet LANs & VLANs Principles	2	1	IP1304	SIP Trunking	2	0.5	MB1305
Broadband Access Technologies	2	1	TY2701	Session Initiation Protocol (SIP)	2	1	MB1401
MPLS	2	1	MB2501	IP Multimedia Subsystem (IMS)	3	2	MB1402
IP Engineering	2	2	IP2300	NGN Voice Protocols	3	3	TY1202
IPv6: Enabling the IoT	2	3	IP1402	SIGTRAN	3	2	QS2600
TCP/IP	2	3	QS2501	Softswitching & VoIP	3	2	IP2001
AAA Diameter	3	2	QS1301	**UMTS & HSPA**	**Level**	**Duration**	**Code**
IP Backbone Traffic Engineering	3	2	IP2301	UMTS System Overview	2	2	MB350
IP Addressing & Internet Protocols Principles	2	1	IP1305	HSPA Principles and Application	1	1	RP2500
Quality of Service Principles	2	2	IP1308	Cell Planning for UMTS Networks	2	2	MB2005
Routing Protocol Principles	2	2	IP1306	UMTS Air Interface	3	3	MB2002
IP Multicast Routing	3	2	IP1311	UMTS Core Network	3	3	MB2004
MPLS VPNs and Traffic Engineering	3	2	IP1312	**GSM**	**Level**	**Duration**	**Code**
OSPF and BGP Routing Protocols	3	2	IP1310	GSM System Overview	2	2	MB20
Quality of Service (QoS)	3	2	IP1309	GSM Air Interface	3	3	MB50
Telecoms Business	**Level**	**Duration**	**Code**	**Telecoms Business**	**Level**	**Duration**	**Code**
5G Technology, Services & Markets	1	1	FG1701	Developing and Communicating Customer Propositions	1	1	LB05
LTE Technologies, Services & Markets	1	1	LT3601	Effective Governance & Corporate Social Responsibility	1	0.5	LB06
Strategy in Business	1	1	LB01	Optimising Operations and Transformation	1	1	LB07
Evaluating and Optimising the Business Models	1	1	LB02	5G - A Business Perspective	1	2	FG20
Business Finance – For Non-Financial Managers	1	1	LB03	Mini-MBA in Telecoms – a Blueprint for Future Business	1	5	WR2001
Leadership in Business	1	2	LB04				

Contact us for detailed course descriptions

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Online Self-Paced Training

5G & Connected Innovation	Study Time	Essential Technologies	Study Time
5G Air Interface	22 Hours	Introduction to Telecoms	32 Hours
5G Air Interface Overview	11 Hours	Telecoms – as an Industry & Business	11 Hous
5G Architecture and Protocols	22 Hours	2G to 5G Mobile Technologies	22 Hours
5G Architecture and Protocols Overview	11 Hours	eSIM Engineering	22 Hours
5G Cell Planning	22 Hours	**Radio Engineering**	**Study Time**
5G Engineering	22 Hours	Open Radio Access Networks (ORAN)	6 Hours
5G Engineering Overview	11 Hours	**LTE**	**Study Time**
5G Radio Access Network	22 Hours	LTE Air Interface	32 Hours
5G Security	11 Hours	LTE Quality of Service	11 Hours
5G Service Based Architecture & Core Network	22 Hours	LTE Billing and Charging	6 Hours
5G Technology, Services and Markets	11 Hours	LTE Evolved Packet Core Network	32 Hours
Rail Communications	**Study Time**	LTE End-to-End Signalling	22 Hours
GSM-R Engineering Overview	22 Hours	LTE Voice - VoLTE	22 Hours
FRMCS - Future Railway Mobile Communications System	22 Hours	**GSM**	**Study Time**
ERTMS-ETCS for Radio Engineers	32 Hours	GSM Air Interface	22 Hours