CERTIFIED 5G ENTERPRISE ENGINEER (C5GEE)

Future-proof yourself with a globally-recognized certification that will equip you with the knowledge and skillset to plan, manage and execute enterprise-level 5G deployment.

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**22-26 April 2024
Wisma Unirazak,
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Global Recognition

World-class Trainers

Industry-centric Syllabus

Training Manual

Lifetime Portal Access

Verifiable Certificate

COURSE OUTLINE

- ✓ Introduction to 5G Technologies
- ✓ Advanced 5G Technologies
- ✓ 5G Radio
- ✓ 5G EMF Radiation Health Issues
- ✓ IPv6 Over 5G
- ✓ Software Defined Network (SDN) for 5G
- ✓ SDN Architecture for 5G
- ✓ 5G Dashboard Management (hands-on)
- ✓ 5G Case Study & Examination

TRAINING PROVIDER

NLTVC EDUCATION · REGISTERED HRDCORP TRAINING PROVIDER

NLTVC Education Sdn Bhd (NLTVC-E) is a premier organization in the area of Next Generation Internet.
We offer the full range of authorized training courses in the field of IPv6, 5G and IoT.

CERTIFIED 5G ENTERPRISE ENGINEER (C5GEE)

RM6,500 ONLY!

5G

HRDCORP CLAIMABLE

Fully certified in just 5 days!

WHO IS IT FOR?

- ✓ Network Administrators
- ✓ Systems & Network Engineers
- ✓ Telco Engineers
- ✓ Network Consultants
- ✓ IT Directors & Managers
- ✓ Network Technicians

RELEVANT INDUSTRIES

- Transport
- Video Surveillance
- Financial Services & Banking
- Media & Entertainment
- Public Safety
- Healthcare
- Automotive
- IoT & Fleet Management
- Smart Manufacturing
- Energy & Utilities

TRAINERS & SPEAKERS

Prof Emeritus Dr Sureswaran Ramadass
PROFESSOR EMERITUS
Malaysia University of Science & Technology

Dr Navaneethan C Arjuman
EXPERT
International Telecommunication Union

Prof Dr Omar Amer Abouabdalla
DEPUTY VC
LimKokWing University

Mohamed Elnour Abdelhafez
IPv6 EXPERT
NLTVC Education Sdn Bhd

Vallikkannu Nagappan
CORPORATE TRAINER
NLTVC Education Sdn Bhd

Prof Emeritus Dr Sureswaran Ramadass

PROFESSOR EMERITUS
Malaysia University of Science & Technology

Professor Emeritus Dr Sureswaran Ramadass is Professor Emeritus at the Malaysian University of Science and Technology (MUST). His current area of focus includes IPv6 and 5G. His last position was as the Chairman of the ITU/UN (International Telecommunications Union) IPv6 and IOT Center of Expertise. Prior to this, he was the founding Director and Professor at the National Advanced IPv6 Centre of Excellence (NAV6), Universiti Sains Malaysia. As the Director of Nav6, he was instrumental in the successful implementation of IPv6 in Malaysia. He obtained his BsEE/CE (Magna Cum Laude) and Masters in Electrical and Computer Engineering from the University of Miami in 1987 and 1990 respectively. He graduated top student in the College of Engineering. He obtained his PhD from Universiti Sains Malaysia (USM) in 2000 while serving as a full time faculty .

Some of his recognitions include being awarded :-

- The "Anugerah Tokoh Negara" (National Academic Leader) for Innovation and Commercialization in 2008 by the Minister of Higher Education. This award is given in recognition to contributions to Innovation and commercialisation in the area of science and technology
- Emeritus Chair, IPv6 Forum Education Programme.
- The Wireless World Research Forum Fellow in April 2010. This fellowship award was presented in recognition to his contribution in the area of Next Generation Networks and IPv6.
- Malaysian Innovation Award by the Prime Minister in 2007 and again by the Minister of Science and Technology in 2009. These Awards were given in ecognition for his contribution towards innovations in the areas of Multimedia Conferencing Systems and Real-time Advanced Security Monitoring.

Prof Dr Omar Amer Abouabdalla

DEPUTY VICE CHANCELLOR
Limkokwing University

Professor Dr Omar obtained his PhD degree and Masters in Computer Sciences from University Science Malaysia (USM) in the year 2004 and 1999 respectively. Currently, he is the Deputy Vice-Chancellor of Limkokwing University. He is a certified trainer for IPv6 and IoT security. He Trained thousands of technical professionals on Next Generation Internet, Network & Data Security and IoT Security. He is a member of IPv6 Forum Malaysia, member of Internet Society (ISOC) and member of Internet Engineering Task Force (IETF). He is actively involved in conducting professional courses on IoT Security, IPv6 and other Computer Network related technologies. He has authored and co-authored more than 60 articles in journals, conference proceedings and book chapters as well as published 3 books.

Dr Navaneethan C Arjuman

EXPERT
International Telecommunication Union

Dr. Navaneethan C. Arjuman is currently a Senior Lecturer at Multimedia University (MMU) and an expert at the International Telecommunication Union (ITU), a United Nations agency.

He holds a PhD in the field of Plug-and-Play Networking Components (IPv6 Cyber Security) from the National Advanced IPv6 Centre, University Science Malaysia. He holds a 1st Class Honours degree in Communication and Signal Processing from Staffordshire University in the United Kingdom. His research interests are in the areas of AI, cyber security, IPv6, 5G, and IoT.

He was awarded the IPv6 Evangelist by the IPv6 Hall of Fame in 2020 for his contribution to the new IPv6 Internet.

He is the Global Coordinator of the Global IPv6 Forum's IPv6 Education Certification Logo Program. He is also currently the Secretary and Head of Training for IPv6 Forum Malaysia, the IPv6 Forum's chapter in Malaysia. He is also a former treasurer and is currently Head of Training for the Malaysia Smart Industry Association. He is currently the chair of the IPv6 Working Group of the Asia-Pacific Advanced Network (APAN). He is also an active member of the Numbering and Electronic Addressing (NEA) and IoT Working Group of Malaysian Technical Standards Forum Bhd (MTSFB). He is currently an active member of Working Group 4 (Network Technology) of the World Broadband Association. He is currently a member of the IPv6 Enhanced Innovation and IPv6 Industry Specification Working Group of ETSI (The European Telecommunications Standards Institute).

He is also the Global IPv6 Forum's Certified Trainer for Certified Network Engineer for IPv6 (CNE6), Certified Security Engineer for IPv6 (CSE6), Certified Network Programmer for IPv6 (CNP6), and Certified System Administrator for IPv6 (CSA6). He is also the Certified Trainer for 5G courses such as Certified 5G Deployment Engineer for IPv6 (C5GDE6), Certified 5G Network Engineer (C5GNE) Silver, and Certified 5G Network Engineer (C5GNE) Gold that were endorsed by the Global IPv6 Forum and the 5G World Alliance. He was the Certified Senior Trainer at the ITU-MUST IPv6 and IOT Centre of Expertise for courses such as Certified IoT Fundamental, Certified IPv6 Fundamental, Certified IPv6 Deployment for 5G Network, Certified IoT Security, etc.

He was former Director of NLTVC Education Sdn Bhd and NM Ninety-Six solutions. He served as Senior Trainer/Researcher with the ITU/UN IPv6 and IOT Centre of Expertise at the Malaysian University of Science and Technology (MUST). He is also a former lecturer at Taylor's University and Sedaya International College (now known as UCSI University). He has also served as CEO and Director of KHEC Systems Sdn Bhd and KHEC Solutions (India) Pvt. Ltd., an IT solutions provider. Prior to this appointment, he served as iNetmon Sdn Bhd's CEO and Director, and before that, as Senior Manager at BayCom Sdn. Bhd., a provider of satellite services. He was also previously a Senior Executive with Maxis Communications Bhd. and has served as Assistant CAD/CAM Manager at Saeilo Japan Sdn Bhd. and Assistant Sales Manager at BMC Systems Sdn Bhd.

Dr Mohd Elnour Abdelhafez
IPv6 EXPERT
NLTVC Education Sdn Bhd

Dr Hafez has executed the roles of Network and Security Engineer, System Administrator, Infrastructure Engineer, Project manager, and Trainer throughout his time in the ICT industry and Academia.

He is in charge of developing and delivering courses in network/information security, IPv6, IoT, and DNS during his career. He has led a number of projects to implement security systems and standards in network operators and other relevant organizations that included RPKI, IPv6 deployment, and DNSSEC for a ccTLD. He has also published research papers on TLS 1.3 performance and security.

Dr Hafez held the position of IPv6 Expert in the Malaysia ITU Centre of Expertise and is also involved in the Global IPv6 Forum Education Logo Programme.

He recently completed his Ph.D. at the Malaysia University of Science and Technology.

Vallikkannu Nagappan
CORPORATE TRAINER
NLTVC Education Sdn Bhd

Ms Vallikkannu is a Qualified Training Specialist adept at planning and implementing onsite and remote training programs. She is an authoritative and clear communicator with enthusiastic style and insightful approach. She is a dedicated training professional with a passion for identifying areas of improvement and developing tailored workshops to bridge skills and knowledge gaps.

She has successfully led cross-functional training sessions for both external and internal clients, providing comprehensive materials and exams to ensure effective learning. One of her strengths lies in promoting a culture of continuous learning, as she has designed long-term curriculums that enable individuals to enhance their skills over time. With a knack for creating engaging and impactful presentations, she strives to maintain participant attention and maximize the value of each training session.

Additionally, she has developed well-structured training manuals, modules, and teaching aids to facilitate the learning process. She brings her expertise and passion for training to contribute to the growth and development of individuals and organizations.

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COURSE OUTLINE

Day 1

9:00 am to 1:00 pm	**Introduction to 5G Technologies** •Evolution of Mobile Technologies from 1G to 5G •5G key Drivers •Enhanced Mobile Broadband (eMBB) •Massive Machine-Type Communications (m-MTC) •Ultra Reliable Low Latency Communications (URLLC) •5G key Drivers: new service capabilities •5G key Drivers: IoT Connectivity •5G Timeline
	LUNCH (1 Hour)
2:00 pm to 5:30 pm	**Advanced 5G Technologies (Part 1)** •5G Overall Architecture •Network Slicing •Network Functions Virtualization (NFV) •Frequency Allocation for 5G Networks •5G Technology Stack

Day 2

9:00 am to 1:00 pm	**Advanced 5G Technologies (Part 2)** •IPv6 for 5G •IPv6 Address Allocation •Mobile IPv6 for 5G •Introducing "My IP My ID" •5G Worldwide Implementation **5G Case Study**
	LUNCH (1 Hour)
2:00 pm to 5:30 pm	**5G Radio** •Overview Wireless and Cellular Communications •ITU Frequency Allocation standards for 5G •Basics of wireless communication •Properties of Radio Signal, Carrier Wave and Modulation •Interference and Noise •Radio Spectrum and sharing radio channel •Beam forming •Massive MIMO •Multiple antenna capabilities •Scalable OFDM-Based Air Interface •Cellular concepts •5G New Radio •5G New Radio Service Classes •Mobile mmWave

CERTIFIED 5G ENTERPRISE ENGINEER (C5GEE)

COURSE OUTLINE

Day 3

9:00 am to 1:00 pm	**5G EMF Radiation Health Issues** •5G EMF base station Radiation •5G Device Radiation. •Relationship between 5G Device & Base station •EMF Standard for 5G •SAR Compliance •Ionizing Radiations •Non-Ionizing Radiations •Frequency Ranges for 5G •5G Densification Effects •Organizations working on EMF exposure issues •EMF measurements and case studies **IPv6 Over 5G** •Advanced Introduction to IPv6 • IPv6 Addressing Schemes • 5G Evolved Packet Core (EPC) • 5G EPC Architecture and IPv6 Traffic Flows • 5G Core Architecture: Native Control and User Plane Separation • 5G Core Architecture and IPv6 Traffic Flows
	LUNCH (1 Hour)
2:00 pm to 5:30 pm	**Software Defined Networks (SDN) for 5G (Part 1)** •Challenges of the Traditional Network •Needing of new network architecture •Traditional networking Vs SDN networking •What is the SDN and OpenFlow? •SDN Value Proposition

Day 4

9:00 am to 1:00 pm	**Software Defined Networks (SDN) for 5G (Part 2)**
	•SDN Revolution
	   - SDN in the Data Center
	   - SDN in Campus Networks
	   - SDN in the Service Providers
	   - SDN Use Cases in the Enterprise
	   - SDN Use Cases in the Mobile Networks
	SDN Architecture for 5G
	
	•Technical differences between SDN and traditional network
	•Characteristics of an SDN Solutions
	•What is NFV?

	LUNCH (1 Hour)
2:00 pm to 5:30 pm	**5G SDN Hands-on Lab** •5G Dashboard Management

Day 5

9:00 am to 1:00 pm	**+ Case Study** **+ Presentation**	2:00 pm to 5:30 pm	**+ Discussion** **+ Exam**