



# **ITU-GSMA Joint Online Capacity Building Course on**

# 5G — The Path to the Next Generation

### 12<sup>th</sup> - 14<sup>th</sup> July 2021 (14:00 PM to 17:00 PM CEST)

### **COURSE OUTLINE**

### **COURSE DESCRIPTION**

Title	Training Course on 5G — The Path to the Next Generation	
Method of delivery	Online	
Course Overview and Objectives	<ul> <li>Course Overview</li> <li>The mobile industry is preparing to embark on the transition to fifth generation (5G) technology, which will build on the achievements of 4G while also creating new opportunities for innovation. 5G will usher in a new era that will see connectivity become increasingly fluid and flexible.</li> <li>This course covers the key aspects of 5G technology and examines the role governments and regulators can play in helping unlock the benefits of future 5G services for their citizens.</li> <li>Course Objectives <ul> <li>Learn about the underlying technologies and concepts associated with 5G.</li> <li>Discover the key differences between 5G and previous generations of mobile technology.</li> <li>Understand how governments and regulators can help accelerate the development of 5G technology and services in their countries.</li> </ul> </li> </ul>	
Dates	12-14 July 2021 (14:00 PM to 17:00 PM CEST)	
Duration	3 Days (3 hours/day)	
Registration deadline	30 June 2021	
Training fees	Free of Charge	
Course code	210I26642MUL-E	

#### **LEARNING OUTCOMES**

At the end of the course, participants will be able to:

- Learn about the underlying technologies and concepts associated with 5G.
- Discover the key differences between 5G and previous generations of mobile technology.

• Understand how governments and regulators can help accelerate the development of 5G technology and services in their countries.

### TARGET POPULATION

This course is open to:

- Regulators
- Policymakers
- Representatives from academia and international organisations working on regulatory or policy issues

The course is only open to those involved in policy and regulation from ICTs ministries and regulators of ITU members.

The course is accredited by the United Kingdom Telecommunications Academy, an internationally recognised centre of excellence in the provision of academic, technical and vocational education in Telecommunications

### **TUTORS/INSTRUCTORS**

NAME OF TUTOR(S)/INSTRUCTOR(S)	CONTACT DETAILS
Dr. Jyrki Penttinen is	
Senior Technology Manager at GSMA, North	jpenttinen@gsma.com
America office.	
Dr. Penttinen has worked on mobile	
telecommunications in Finland, Spain, Mexico, and	
the USA. His past employers include Telia Sonera,	
Nokia, and G+D Mobile Security Americas. He is	
experienced in research and operational activities	
such as planning, optimization, measurements,	
system architectures, and services. Since 2014, he	
focused on security solutions and developing	
industry trends. At present, he assists operator	
members with the adoption, design, development,	
and deployment of GSMA specifications and	
programmes. Dr. Penttinen has also authored	
various books on 5G and other telecommunication	
technologies.	
Barbara Pareglio has over 20 years of experience in	
the mobile industry. She has been part of the GSMA	BPareglio@gsma.com
Internet of Things Programme since 2014, working	
on several aspects of the IoT such as the	
development of the Mobile IoT Technologies (LTE-	
M, NB-IoT), GSMA IoT Security Guidelines, GSMA	
Drone Interest Group and looking at a variety of	
emerging technologies, like machine learning/AI and	
edge computing, for helping the mobile industry to	
create trusted solutions for the IoT. Before joining	
the GSMA Barbara worked in R&D in several areas	
of telecommunications, including Intelligent	
Networks, IMS, Service Enabling and M2M/IoT. She	
also participate in and actively contributed to	
several standards.	
The GSMA Internet of Things Programme help	
operators to fully realise the opportunity in the IoT,	
operators must deliver secure IoT networks as well	
as scalable value added data services for the world's	

industry and machines beyond connectivity. This is to be achieved by industry collaboration, appropriate regulation, optimising networks as well as developing key enablers to support the growth of	
IoT.	

## **EVALUATION**

I. Post Test. II. Case Study. III. Quizzes.

# TRAINING SCHEDULE AND CONTENTS / AGENDA

Day 1: Setting the scene: Introducing the 5G era [3 hours]       Time; Start time       Topics/Activities         12/07/2021       14:00 - 17:00       Session 1: Development of 5G era Welcome, introductions Introducing the 5G era The Development of Mobile Technology Q&A         Day 2: Business models and strategies [3 hours]       Time; Start time       Session 2: Use Cases Initial Use Cases: eMBB, FWA, IoT, URLLS Group Exercise Q&A         Day 2: Business models and strategies [3 hours]       Time; Start time       Topics/Activities         13/07/2021       14:00 - 17:00       Session 3: Status, business models Global 5G Spectrum and deployment status, forecasts Business models Q&A         Day 3: Spectrum, transition strategies [3 hours]       Time; Start time Q&A       Topics/Activities         13/07/2021       Time; Start time Q&A       Session 4: Deployment options and enablers Q&A         Session 4: Deployment options and enablers Q&A       Deployment strategies Group Exercise Q&A         13/07/2021       Time; Start time Session 5: G bands The status of 5G Spectrum across the globe			
Introducing the SG era [3 hours]14:00 - 17:00Session 1: Development of SG era • Welcome, introductions • Use Cases • The Development of Mobile Technology • Q&ADay 2: Business models and strategies [3 hours]Time; Start timeTopics/Activities • Group Exercise • Q&A13/07/202114:00 - 17:00Session 3: Status, business models • Global SG Spectrum, transition • Group Exercise • Group Exercise • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start timeTopics/Activities • Global SG Spectrum and deployment status, forecasts • Business models • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start timeSession 4: Deployment options and enablers • Deployment strategies • Group Exercise • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start timeTopics/Activities • Session 3: Status, business models • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start timeSession 4: Deployment options and enablers • Deployment strategies • Group Exercise • Key technical enablers • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start timeSession 5: SG bands The status of SG spectrum across the globe		Time: Start time	Topics/Activities
12/07/202114:00 - 17:00Session 1: Development of 5G era • Welcome, introductions • Introducing the 5G era • The Development of Mobile Technology • Q&ADay 2: Business models and strategies [3 hours]Time; Start time 14:00 - 17:00Session 3: Status, business models • Global 5G Spectrum and deployment status, forecasts • Business models • Global 5G Spectrum and deployment status, forecasts • Business models13/07/202114:00 - 17:00Session 4: Deployment options and enablers • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start time 14:00 - 17:00Copics/ActivitiesDay 3: Spectrum, transition strategies [3 hours]Time; Start time 4:00 - 17:00Session 5: SG bands The Starts Spectrum arcross the globe	-		
12/07/2021       14:00 - 17:00       • Welcome, introductions         • Introducing the SG era       Introducing the SG era         • The Development of Mobile Technology       • Q&A         BREAK       Session2: Use Cases         • Initial Use Cases: eMBB, FWA, IoT, URLLS       • Group Exercise         • Q&A       Velcome, introductions         Day 2: Business models and strategies [3 hours]       Time; Start time       Topics/Activities         13/07/2021       14:00 - 17:00       Session 3: Status, business models       • Global SG Spectrum and deployment status, forecasts         BREAK       Session 4: Deployment options and enablers       • Deployment strategies       • Group Exercise         • Q&A       BREAK       Session 4: Deployment options and enablers       • Q&A         Bareak       Session 4: Deployment strategies       • Group Exercise       • Key technical enablers         • Q&A       BREAK       Session 4: Deployment strategies       • Group Exercise         • Key technical enablers       • Q&A       • Q&A       • Couplay A         Bareak       Session 5: SG bands       • Ne status of SG spectrum across the globe	[3 hours]		
Pay 2: Business models and strategies [3 hours]       Time; Start time       Topics/Activities         13/07/2021       14:00 - 17:00       Session 3: Status, business models         •       Global 5G Spectrum, transition strategies [3 hours]       14:00 - 17:00         Session 4: Deployment options and enablers       •       0.0000         •       Global 5G Spectrum and deployment strategies       •         Session 5: SG Spectrum and enablers       •       0.0000         •       Global 5G Spectrum and enablers       •         •       Q&A       BREAK         Session 4: Deployment options and enablers       •       0.0000         •       Global 5G Spectrum and deployment status, forecasts       •         Business models       •       0.0000         •       Global 5G Spectrum and deployment status, forecasts       •         •       Business models       •       0.0000         •       Q&A       Session 4: Deployment options and enablers       •         •       Deployment strategies       •       0.0000         •       Global 5G Spectrum transition       •       0.0000         •       Deployment options and enablers       •       0.0000         •       Q&A       Session 5: 5G bands	12/07/2021	14:00 - 17:00	
image: basis and strategies [3 hours]Time; Start timeimage: constrategies (2 hours)13/07/2021Time; Start timeSession 3: Status, business models • Q&ABase 3: Spectrum, transition strategies [3 hours]Time; Start timeSession 3: Status, business models • Q&A13/07/202114:00 - 17:00Session 3: Status, business models • Q&ABase 3: Spectrum, transition strategies [3 hours]Time; Start time13/07/2021Time; Start time13/07/2021Time; Start time13/07/2021Time; Start time13/07/2021Time; Start time13/07/2021Time; Start time14:00 - 17:00Session 5: SG bands • Q&A13/07/2021Time; Start time14:00 - 17:00Session 5: SG bands • Q&A		11100 17100	
<ul> <li>Q&amp;A</li> <li>BREAK</li> <li>BREAK</li> <li>Session2: Use Cases         <ul> <li>Initial Use Cases: eMBB, FWA, IoT, URLLS</li> <li>Group Exercise</li> <li>Q&amp;A</li> </ul> </li> <li>Day 2: Business models and strategies [3 hours]</li> <li>Time; Start time time; Starts time Global 5G Spectrum and deployment status, forecasts</li> <li>Business models</li> <li>Q&amp;A</li> <li>BREAK</li> <li>Business models</li> <li>Q&amp;A</li> <li>BREAK</li> <li>Business models</li> <li>Global 5G Spectrum and deployment status, forecasts</li> <li>Business models</li> <li>Q&amp;A</li> <li>BREAK</li> <li>BREAK</li> <li>Break</li> <li>Break</li> <li>Session 4: Deployment options and enablers</li> <li>Q&amp;A</li> <li>Break</li> <li>Break</li> <li>Break</li> <li>Break</li> <li>Session 4: Deployment options and enablers</li> <li>Q&amp;A</li> <li>Break</li> <li>Break</li> <li>Break</li> <li>Break</li> <li>Session 5: SG bands</li> <li>The status of 5G spectrum across the globe</li> </ul>			-
BrackBrackSession2: Use CasesInitial Use Cases: eMBB, FWA, IoT, URLLS• Group Exercise• Q&ADay 2: Business models and strategies [3 hours]13/07/202114:00 - 17:00Session 3: Status, business models • Q&ABrackBrackBrackSession 4: Deployment options and enablers • Q&ASession 4: Deployment strategies • Q&ABrackSession 5: SG bands The status of SG spectrum across the globe			
Day 2: Business models and strategies [3 hours]Time; Start timeSession 2: Use Cases • Initial Use Cases: eMBB, FWA, IoT, URLLS • Group Exercise • Q&A13/07/202114:00 - 17:00Session 3: Status, business models • Global 5G Spectrum and deployment status, forecasts • Business models • Q&ABREAKBREAKDay 3: Spectrum, transition strategies [3 hours]Time; Start time13/07/202114:00 - 17:00Session 4: Deployment options and enablers • Deployment strategies • Group Exercise • Key technical enablers • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start time 14:00 - 17:003/07/202114:00 - 17:00			• Q&A
Day 2: Business models and strategies [3 hours]Time; Start timeSession 2: Use Cases • Initial Use Cases: eMBB, FWA, IoT, URLLS • Group Exercise • Q&A13/07/202114:00 - 17:00Session 3: Status, business models • Global 5G Spectrum and deployment status, forecasts • Business models • Q&ABREAKBREAKDay 3: Spectrum, transition strategies [3 hours]Time; Start time13/07/202114:00 - 17:00Session 4: Deployment options and enablers • Deployment strategies • Group Exercise • Key technical enablers • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start time 14:00 - 17:003/07/202114:00 - 17:00			
Initial Use Cases: eMBB, FWA, IoT, URLLS Group Exercise • Q&ADay 2: Business models and strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 3: Status, business models • Global 5G Spectrum and deployment status, forecasts • Business models • Q&ABEEAKBEEAKSession 4: Deployment options and enablers • Deployment strategies • Group Exercise • Key technical enablers • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start time13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			BREAK
Initial Use Cases: eMBB, FWA, IoT, URLLS Group Exercise • Q&ADay 2: Business models and strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 3: Status, business models • Global 5G Spectrum and deployment status, forecasts • Business models • Q&ABEEAKBEEAKSession 4: Deployment options and enablers • Deployment strategies • Group Exercise • Key technical enablers • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start time13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			
Initial Use Cases: eMBB, FWA, IoT, URLLS Group Exercise • Q&ADay 2: Business models and strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 3: Status, business models • Global 5G Spectrum and deployment status, forecasts • Business models • Q&ABEEAKBEEAKSession 4: Deployment options and enablers • Deployment strategies • Group Exercise • Key technical enablers • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start time13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			
Day 2: Business models and strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 3: Status, business models - Global 5G Spectrum and deployment status, forecasts - Business models - Q&ABREAKBREAKSession 4: Deployment options and enablers - Deployment strategies - Group Exercise - Key technical enablers - Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start time13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			
Day 2: Business models and strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 3: Status, business models - Global 5G Spectrum and deployment status, forecasts - Business models - Q&ABREAKBREAKSession 4: Deployment options and enablers - Deployment strategies - Group Exercise - Key technical enablers - Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start time13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			<ul> <li>Initial Use Cases: eMBB, FWA, IoT, URLLS</li> </ul>
Day 2: Business models and strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 3: Status, business models • Global 5G Spectrum and deployment status, forecasts • Business models • Q&ABREAKSession 4: Deployment options and enablers • Deployment strategies • Group Exercise • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start time13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			Group Exercise
strategies [3 hours]Time; start timeTopics/Activities13/07/202114:00 - 17:00Session 3: Status, business models • Global 5G Spectrum and deployment status, forecasts • Business models • Q&ABREAKBREAKSession 4: Deployment options and enablers • Deployment strategies • Group Exercise • Key technical enablers • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			• Q&A
strategies [3 hours]Time; start timeTopics/Activities13/07/202114:00 - 17:00Session 3: Status, business models • Global 5G Spectrum and deployment status, forecasts • Business models • Q&ABREAKBREAKSession 4: Deployment options and enablers • Deployment strategies • Group Exercise • Key technical enablers • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			
strategies [3 hours]Time; start timeTopics/Activities13/07/202114:00 - 17:00Session 3: Status, business models • Global 5G Spectrum and deployment status, forecasts • Business models • Q&ABREAKBREAKSession 4: Deployment options and enablers • Deployment strategies • Group Exercise • Key technical enablers • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			
strategies [3 hours]IdeaIdea13/07/202114:00 - 17:00Session 3: Status, business models • Global 5G Spectrum and deployment status, forecasts • Business models • Q&ABREAKBREAKSession 4: Deployment options and enablers • Deployment strategies • Group Exercise • Key technical enablers • Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start time13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe	Day 2: Business models and	Time: Start time	Topics/Activities
13/07/2021       14:00 - 17:00       • Global 5G Spectrum and deployment status, forecasts         • Global 5G Spectrum and deployment status, forecasts       • Business models         • Q&A       • Global 5G Spectrum and deployment status, forecasts         • BREAK       • Session 4: Deployment options and enablers         • Deployment strategies       • Group Exercise         • Key technical enablers       • Q&A         13/07/2021       14:00 - 17:00         Session 5: 5G bands The status of 5G spectrum across the globe	strategies [3 hours]	Time, Start time	Topics/ Activities
Day 3: Spectrum, transition strategies [3 hours]       Time; Start time       Global SG Spectrum and deployment status, forecasts         13/07/2021       14:00 - 17:00       Session 5: 5G bands The status of 5G spectrum across the globe	13/07/2021	1/1.00 - 17.00	Session 3: Status, business models
Day 3: Spectrum, transition strategies [3 hours]Time; Start timeCopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe	13/07/2021	14.00 17.00	
Day 3: Spectrum, transition strategies [3 hours]       Time; Start time 14:00 - 17:00         13/07/2021       14:00 - 17:00			
Day 3: Spectrum, transition strategies [3 hours]       Time; Start time       Topics/Activities         13/07/2021       14:00 - 17:00       Session 5: 5G bands The status of 5G spectrum across the globe			• Q&A
Day 3: Spectrum, transition strategies [3 hours]       Time; Start time       Topics/Activities         13/07/2021       14:00 - 17:00       Session 5: 5G bands The status of 5G spectrum across the globe			PDF4//
Day 3: Spectrum, transition strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			BREAK
Day 3: Spectrum, transition strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			
Day 3: Spectrum, transition strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			Cassion 4 Donloymont ontions and archlore
Group Exercise• Group Exercise• Key technical enablers• Q&ADay 3: Spectrum, transition strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			
Day 3: Spectrum, transition strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			
Day 3: Spectrum, transition strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			
Day 3: Spectrum, transition strategies [3 hours]Time; Start timeTopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			
strategies [3 hours]Time, start timeTopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			• Q&A
strategies [3 hours]Time, start timeTopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe			
strategies [3 hours]Time, start timeTopics/Activities13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe	Day 3: Spectrum transition		
13/07/202114:00 - 17:00Session 5: 5G bands The status of 5G spectrum across the globe		Time; Start time	Topics/Activities
13/07/2021     14:00 - 17:00       The status of 5G spectrum across the globe		44.00 (7.00	Session 5: 5G bands
	13/0//2021	14:00 - 17:00	
			• 2G/3G Rationalisation

• Q&A
BREAK
Session 6: Safety and capacity considerations
• 5G and RF-EMF
The Capacity Challenge
• Q&A

### METHODOLOGY

The on-line program will include Instructor-led presentations, Case Studies, Group Exercises, and Quizzes.

### **COURSE COORDINATION**

GSMA Training Coordinator:	ITU Coordinator:
Aanchal Paliwal, Partner & Delivery Manager, Capacity Building, GSMA	<b>Eng. Mustafa Al Mahdi</b> Programme Officer
	ITU Arab Regional Office
apaliwal@gsma.com	Tel: +202 3537 1777 Mobile: +20114 1177573
	Fax: +202 3537 1888
	Email: <u>mustafa-ahmed.al-mahdi@itu.int</u>

### REGISTRATION

### ITU Academy portal account

Registration should be made online at the ITU Academy portal. To be able to register for the course you **MUST** first create an account in the ITU Academy portal at the following address: <u>https://academy.itu.int/user/register</u>

### Training course registration

When you have an existing account or created a new account, you can register for the course online at the following link: <u>https://academy.itu.int/training-courses/full-catalogue/5g-path-next-generation</u>

You can also register by finding your desired course in our training catalogue <u>https://academy.itu.int/training-courses/full-catalogue</u>