IITM PRAVARTAK CATALYSING INNOVATION

Megam Solutions

Next Generation Mobile Wireless Networks

Lab Integrated Training Program for Professionals

Course **Objective**

Next Generation Mobile Wireless Networks - Digitisation of industries and penetration of mobile devices is triggering the need for high speed and low-latency connectivity services. Mobile Wireless Networks are going through a rapid transformation to support Industrial 4.0, Smart Healthcare and Internet of Things (IOT) applications. This course is aimed at providing in-depth understanding of the next generation mobile wireless networks covering technologies such as **5G, 5Gi, Software Defined Networks, Networks Functions Virtualisation and Multi-access Edge Computing (MEC).** This course will enable the participants to conceptualize, design and build solutions leveraging the next generation mobile wireless networks.

Course **Benefits**

- Helps participants to accelerate their career growth by gaining in-depth knowledge on 5G concepts
- Enables professionals and executives to jump start on projects involving 5G
- Provides confidence to have technical discussions with customers, partners and internal stake holders on areas related to 5G

Course **Activities**

Hands-on Activities, Teach-back sessions, Case Studies, Quizzes, Panel Discussions, and Demonstration Videos

2 ungraded assignments, 2 graded assignments, and 2 exams

Labs

5G

SDN

Software-Defined Networking

NFV

Network functions virtualization

Course **Pre-requisites**

Familiarity with the basics of networking is preferred. Prior knowledge of wireless networks is NOT required.

Course **Brief**

6
months
Sat and Sun,
Alternate Weekends

120
Hours
of Sessions

4
Hours
of Training on
Training Days

Online class
(Post Covid19 pandemic, in-person classes at IITM Pravartak Premises, for those who are willing to attend in Chennai)

80%
Attendance Must

Course **Details**

Module	Contents
1	**Evolution of Wireless Networks & Network Architecture** • 1G Networks • 2G Networks • 3G Networks • 4G Networks • Role of 3GPP, ITU, GSMA and IETF in the standardization of wireless technologies

Course **Details**

Module	Contents
1	**Evolution of Wireless Networks & Network Architecture** • 4G Data Connection Establishment • Voice calls in 4G Network • Evolution of Radio Access Network (RAN) • Need for 5G
2	**5G Overview** • Characteristics of 5G • 5G Components • 5G Use Cases • 4G versus 5G
3	**Introduction to 5Gi, 5Gi Capabilities and Use Cases**
4	**5G Architecture** • 5G System Architecture • 5G Deployment Architectures • Next Generation Core (NG-Core) • Next Gen Radio Access Networks (NG-RAN) • 5G New Radio (5G NR)
5	**Technologies accelerating 5G Radio, Small Cells, 5G Call Flows.**
6	**3GPP Protocol Stack for 5G** • 3GPP L1/L2/L3 Protocol Stack for 5G

Module	Contents
7	**SDN/NFV in 5G networks** • What is NFV? • Need for NFV • NFV Architecture • Virtualized RAN (vRAN) • Virtualized 5G Core • Benefits of NFV • Role of NFV in 5G networks.
8	**Network Slicing** • What is Network Slicing? • Requirements for Network Slicing • Network Slice Management, and benefits
9	**Multi-access Edge Computing** • Need for MEC • MEC Architecture • MEC Deployment modes • MEC Deployment Scenarios in 5G Network • Integrating MEC with 5G Networks • MEC Use Cases • Benefits of MEC
10	**Security in 5G Networks** • Need for Security in 5G networks • Security features in 5G network • Mitigating the threats in the 5G Network

Module	Contents
11	**5G Uses Cases** • Enhanced Mobile Broadband (eMBB) • Fixed Wireless • Live TV • Robotic Surgery • Autonomous Cars • Virtual Reality (VR) / Augmented Reality (AR) • Private Wireless Network • Mobile Service • Holographic Call
12	**Role of 5G in Industry 4.0 & IoT**
13	**5G Marketplace – Vendors & Solutions** • 5G Vendors • 5G Standard Bodies • 5G Deployments
14	**5G Open Source Communities & Standard Bodies** • 5G Open RAN • 5G Open Air Interface (OAI) • 5G Open Source (free5GC, ONAP) • MEC Open-Source • Communities (Akraino, EdgeX Foundry, StarlingX)

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