**Course Sr. No. 16**

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| A. | **Name of the Institute** | Centre for Development of Advanced Computing, Mohali |
| B. | **Name/title of the Course** | **Specialized Training programme in Mobile Device Security** |
| C. | **Proposed Dates and Duration of the Course in weeks/ months** | Duration: **Eight weeks**From: **21st Oct. 2019 to 13th Dec.2019** |
| D. | **Eligibility Criteria for Participants** |
| 1. Educational Qualification
 | Technical Graduate (Computer Science/ Electronics/Telecommunications/ or equivalent) with working knowledge of computers. |
| 1. Work Experience
 | As per MEA guidelines |
| 1. Age Limit
 | As per MEA guidelines |
| 1. Target group (Level of participants and target ministry/department etc. may be identified)
 | Working Professional with knowledge of computers and mobile devices with some programming language exposure. |
| E. | Aims & Objectives of the Course | To develop in-depth knowledge and understanding of the mobile device security domain. Provides an introduction to mobile device architecture, malicious applications & it’s analysis, threats to mobile devices and security measures.  |
| F. | Details / Content of the Course ***(please attach detailed Course Profile****)* | As per sheet attached |
| G. | Mode of Evaluation of Performance of the ITEC Participant | Theory, viva voce & Practical |

**Course Content:**

1. **Introduction to Mobile Operating System**
* Android Operating System: Framework, Architecture, Application design
* Android Virtual Machine-Dalvik Executable (DEX), Optimized DEX (ODEX)
* Android Security Model - UID Separation, Sandboxing
* iOS Operating System: Architecture, Security framework, device Jailbreaking, iOS privileges
1. **Understanding Executable Files and Vulnerabilities**
* Introduction to APK Structure - APK Contents, AndroidManifest.xml, Other Files
* Reversing APKs: Tools - Dex2Jar, Obfuscation;
* Application Structure- Java, AndroidManifest.xml, Deep Links- AIDL, Bound Services, onBind, Messenger, Binder
* Components- Activities, Services, Broadcast Receivers, Permission Models
* WebViews - JavaScript, JavaScript Bridge, Content Provider Access
* Brief Introduction of Android Malwares till date, Logging based Vulnerabilities, Bypassing SSL pinning, Exploiting weaknesses in mobile apps
* Introduction to Mobile Sensors
1. **Device and Data Security**
* Data Storage -Internal Storage, External Storage, Local Databases-Sqlite3
* Device Administration API- MDM Solutions, Root Detection
* Third-Party Code- SDK, Libraries
* Device Tracking
1. **Mobile Device Malware Threats**
	* Trends and popularity of mobile device malware
	* Mobile malware command and control architecture
	* Efficiency of Android ransomware malware threats
	* Hands-on analysis of Android malware
* Mobile malware defenses: what works, and what doesn't
1. **Static Code Analysis**
* Vulnerability Exploitation, Retrieving Android apps for reverse engineering analysis
* SQL Injection
* Vulnerable Activities, Vulnerable Receivers, Vulnerable Services
* Android application interaction and Intent manipulation with tools
1. **Dynamic Code Analysis**
* Debugging: debug gable, breakpoints
* Android Debug Bridge- ADB Commands, Activity Manager
* Additional Tools -Interacting with Databases, Android Device Monitor