Course Code	Course Title	L	T	P	C
1156EC412	EMBEDDED LINUX SECURITY	0	0	0	2

a) Course Category

Independent Learning

b) Preamble

The course blends the presentation of content reinforced the development of embedded system with high security using a real-world example. The students will learn how to increase security in their system

c) Prerequisite

Nil

d) Related Courses

Embedded OS and Device Drivers, Embedded Systems and Robotics

e) Course Outcomes

Upon the successful completion of the course, students will be able to

CO Nos.	Course Outcomes	Knowledge Level (Based on Revised Bloom's Taxonomy)
CO1	Understanding security requirements and what needs to be protected	K2
CO2	Analysing the system and software architecture with respect to security	K2
CO3	Hardening the software environment to resist commonly used attacks	K2
CO4	Restricting access to and from the network	K2
CO5	Protecting sensitive data on the filesystem	K2

f) Course Content

UNIT I NEED FOR SECURITY

Security fundamentals, Security concepts and terminology, Security guiding principles Secure Software Development Lifecycle, Architecture and design, Attack surface reduction, The threat modeling process, Security assessment

UNIT II BOOTING A LINUX SYSTEM

The bootloader, Debug and trace, Building a chain of trust, The Linux Kernel interface, Example boot scenarios and fast boot, Hibernation and security

UNIT III LINUX KERNEL SECURITY

Introduction to Linux Kernel Security, Hardening the kernel, Kernel modules, Crypto subsystem and key management, Random Number Generation. Securing the runtime environment: Dynamic loading, Linux Dynamic Linker, Limiting resources

UNIT IV Linux Security Modules

Introduction to LSMs, Overview of LSMs, Access Control Mechanisms, SE Linux LSM, Security testing and release control

UNIT V Developing and building secure software

Writing secure software, secure software developer, Coding conventions and standards, Working with sensitive data and algorithms, Code review and test, Choice of programming language

g) Learning Resources

Online Resources

1. https://www.doulos.com/content/training/emblinux_security_comprehensive.php
2. https://www.udemy.com/linux-security
3. https://www.coursera.org/learn/linux-server-management-security