

Course Code	Course Title	L	T	P	C
1156EC414	EMBEDDED DESIGN VERIFICATION AND TESTING	0	0	0	2

**a) Course Category**

MOOC / Independent Learning

**b) Preamble**

The course delivers end-to-end understanding of the overall Embedded System design process

**c) Prerequisite**

Nil

**d) Related Courses**

Embedded System Design with ARM

**e) Course Outcomes**

CO Nos.	Course Outcomes	Knowledge Level (Based on Revised Bloom's Taxonomy)
1	Explain in general the testing of Embedded System and its components.	K2
2	Describe the Embedded System hardware testing	K2
3	Discuss the Embedded system faults, BIST, fault tolerant ,Testing and interaction between HW SW.	K2
4	Describe the Embedded System Software testing	K2
5	Explain the different Embedded Software testing methods	K2

**f) Course Content**

**UNIT I TESTING OF EMBEDDED SYSTEM**

Definition of embedded system and its components, embedded system testing, fault in embedded system, testing of embedded core based SOC, on line testing, introduction to digital testing, test pattern generation

## **UNIT II EMBEDDED SYSTEM HARDWARE TESTING**

Scan chain based sequential circuit testing, software hardware co validation fault models and high level testing for complex embedded system, embedded system hardware, testing for embedded cores, bus and memory testing.

## **UNIT III ADVANCES IN EMBEDDED SYSTEM HARDWARE TESTING**

Testing for advanced faults in real time embedded systems, BIST for embedded system, concurrent testing for fault tolerant embedded system, testing for reprogrammable hardware interaction testing between hardware and software

## **UNIT IV FUNDAMENTALS OF EMBEDDED SOFTWARE TESTING**

Embedded system basics, test standards, depicting level of testing, software life cycle, embedded V model life cycle, master test planning.

## **UNIT V EMBEDDED SOFTWARE TESTING METHODS**

Testing methods: dynamic testing, block box testing, model based design testing, gray box testing and white box testing, unit testing, integration testing and validation testing.

### **g) Learning Resources**

#### **Reference Books**

1. <https://www.coursera.org/learn/introduction-embedded-systems>
2. [https://www.youtube.com/watch?v=VPDxNC\\_fykc&list=PLwdnzlV3ogoVjd2oVYYXcclK3wFgu8FKn&index=2](https://www.youtube.com/watch?v=VPDxNC_fykc&list=PLwdnzlV3ogoVjd2oVYYXcclK3wFgu8FKn&index=2)
3. [https://www.youtube.com/watch?v=Abvlh36X\\_XU&list=PLwdnzlV3ogoVjd2oVYYXcclK3wFgu8FKn](https://www.youtube.com/watch?v=Abvlh36X_XU&list=PLwdnzlV3ogoVjd2oVYYXcclK3wFgu8FKn)
4. <https://www.youtube.com/watch?v=Gkp753foAgE&list=PLwdnzlV3ogoVjd2oVYYXcclK3wFgu8FKn&index=5>
5. <https://www.youtube.com/watch?v=6EKpkO6oWWw&list=PLwdnzlV3ogoVjd2oVYYXcclK3wFgu8FKn&index=6>
6. [https://www.youtube.com/watch?v=LFPvA\\_AK0IQ&list=PLwdnzlV3ogoVjd2oVYYXcclK3wFgu8FKn&index=7](https://www.youtube.com/watch?v=LFPvA_AK0IQ&list=PLwdnzlV3ogoVjd2oVYYXcclK3wFgu8FKn&index=7)
7. <https://www.youtube.com/watch?v=sW9GAtcSflg&index=8&list=PLwdnzlV3ogoVjd2oVYYXcclK3wFgu8FKn>
8. <https://www.youtube.com/watch?v=si8UQkpSF3Y&index=15&list=PLwdnzlV3ogoVjd2oVYYXcclK3wFgu8FKn>
9. <https://nptel.ac.in/courses/117106112/>
10. <https://freevideolectures.com/course/3478/embedded-software-testing>