

## EMERGING TECHNOLOGIES

### 5G TECHNOLOGY

**CIE + SEE : 00**

**COURSE OBJECTIVES:**

1. Acquire knowledge about different generations of mobile communication
2. Understanding LTE features which led to 5G
3. Familiarising 5G key features and architecture
4. Application of 5G in enabling IOT
5. Understand software defined radio and cognitive radio.

**COURSE OUTCOMES:**

After the end of the course, the students will be able to

<b>CO1</b>	To know about different generations of mobile communications
<b>CO2</b>	Analyze the difference between 4G and 5G services
<b>CO3</b>	Interpret the working principle of , SDR , Cognitive concepts
<b>CO4</b>	Acquire knowledge about 5G Technology features
<b>CO5</b>	Understand the Application of 5G in enabling IOT
<b>CO6</b>	Preparing report on emerging wireless technologies

### Mapping of Course Outcomes to Program Outcomes :

[illegible]

Module	Contents of the Module	Hours	CO
1	Communication Technology from 1G to 5G-Overview. LTE features and its impact on services. 5G Technology Key Features. 5G architecture. Enabling Massive IOT.	12	CO1 CO2 CO3
2	Massive MIMO. Coherent Optical Transmission Systems (GHz speed). Software Defined Radio & its evolution. Cognitive Radio & its evolution. Quality of service and management in 5G. Overview of next generation communications & its applications.	13	CO4 CO5 CO6

#### REFERENCE BOOKS:

1. Kalyan Sundar, Lawrence C. Miller, "5G for dummies", Ixia Special Edition, *John Wiley and Sons inc.*, 2017.
2. Akhil Gupta, Rakesh Kumar Jha, "A Survey of 5G Networks : Architecture and emerging technology", *IEEE Access*, Jul. 22, 2015.
3. Alexander M. Wyglinski, "Cognitive Radio Communications and Networks", 2010, *Elsevier Publications*.

#### WEB RESOURCES:

1. <https://5g-ppp.eu/>
2. <http://www.massivemimo.eu/>
3. <http://www.3gpp.org>

#### ASSESSMENT PATTERN:

**Project :** Only one mini project report to be submitted & at the end of the course & the write-up will be evaluated, the work has to be done in the 5<sup>th</sup> semester only, it can be in groups also.

**CIE, Assignment & Quiz :** Two CIE tests, Case study report for assignment, Quiz or activity

**Evaluation Pattern :** CIE tests 30; Assignment 10, Quiz/Activity 10

**CIE – Continuous Internal Evaluation Theory (50 Marks) :**

<b>Bloom's Category</b>	<b>Tests – 3 CIEs (Nil)</b>	<b>Assignments – Nil</b>	<b>Quizzes – Nil</b>	<b>Report / Model Building</b>	<b>Presentation / Evaluation</b>
<b>Marks (Out of 50)</b>	-	-	-	<b>30</b>	<b>20</b>
Remember	-	-	-	-	-
Understand	-	-	-	-	-
Apply	-	-	-	-	-
Analyze	-	-	-	-	-
Evaluate	-	-	-	-	-
Create	-	-	-	-	-

**SEE –Semester End Examination Theory (50 Marks) :**

<b>Bloom's Category</b>	<b>Theory Marks (50)</b>
Remember	5
Understand	5
Apply	10
Analyze	10
Evaluate	10
Create	10