

**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

<b>COURSE PLAN</b>			
<b>Course Title</b>	NEXT GENERATION WLAN		
<b>Course Code</b>	EC634	<b>No. of Credits</b>	3
<b>Department</b>	ECE	<b>Faculty</b>	Dr. B.Malarkodi
<b>Pre-requisites Course Code</b>	EC 613 High speed communication Networks		
<b>Course Coordinator(s) (if, applicable)</b>			
<b>Other Course Teacher(s)/Tutor(s) E-mail</b>	malark@nitt.edu	<b>Telephone No.</b>	9894768765
<b>Course Type</b>	Elective/open Elective		
<b>COURSE OVERVIEW</b>			
The aim of this course is to introduce the students wireless local area network standards, to analyse network operations and protocols			
<b>COURSE OBJECTIVES</b>			
To expose students to wireless local area network standards, technologies and operations with real life traces to correlate with the concepts			
<b>COURSE OUTCOMES (CO)</b>			
<b>Course Outcomes</b>	<b>Aligned Programme Outcomes (PO)</b>		
1. To understand basics of WLAN systems including standardizing bodies, unlicensed spectrum ranges, network types	1		
2. Appreciate physical layer challenges and solutions in 802.11 standards and be able to simulate channel conditions	4		
3. Be able to explain MAC layer steps in WLAN along with the motivation and impact on throughput and coexistence	5		
4. Trace the steps followed in a typical WLAN network with a clear understanding of security, power save and network entry procedures	9,10,11		
5. Analyse real life protocol traces under various conditions and correlate with the concepts learnt in the earlier sections	9,10,11		



## COURSE TEACHING AND LEARNING ACTIVITIES

S. No.	Week	Topic	Mode of Delivery
1.	1	Introduction on WLAN, Classification, reference model of protocol architecture protocol stack basics	Chalk and Talk, PPT
2.	2	RF spectrum of operations, unlicensed band usage, types of networks and their usage	Chalk and Talk, PPT
3.	3	Survey of WLAN products in consumer appliances and their types overview of various WLAN certified products and programs	Chalk and Talk, PPT
4.	4,5	WLAN physical layer – Indoor multipath channel conditions and models, Delay spread and ISI impacts on high data rate transmission	Chalk and Talk, PPT
5	6	Evolution of WLAN PHY layer, OFDM design and parametres	Chalk and Talk, PPT
6.	7,8	MIMO usage in WLAN, Study of channel model characteristics-Matlab simulation Checking evm effects due to frequency offset	Chalk and Talk, PPT
7.	9	CSMA/CA principles used for WLAN MAC, Medium reservation and hidden nodes	Chalk and Talk, PPT
8.	10,11,	MAC frame aggregations and QOS in WLAN, Roaming, Frame duration calculation, NAV values in RTS/CTS frames, Throughput calculation with and without aggregation	Chalk and Talk, PPT
9	12,13	Network entry process in WLAN, Security evolution, Power save concepts	
		Throughput and performance of WLAN, Exercises using opensource tool wire shark	
10.	14,15,16	Sniffing WLAN frames and analysis, Inferring capabilities of Aps and clients, Analysing network entry steps and debugging connection problems, Analysis of data transmission and debugging performance issues and roaming performance	Chalk and Talk, PPT

<b>COURSE ASSESSMENT METHODS</b>				
<b>S.No.</b>	<b>Mode of Assessment</b>	<b>Week/Date</b>	<b>Duration</b>	<b>% Weightage</b>
1.	<b>ASSESSMENT I</b> Descriptive Type Examination (1 ½ Units )	Will be decided in CCM	60 Minutes	20
2.	<b>ASSESSMENT II</b> Descriptive Type Examination (1 ½ Units )		60 minutes	20
3.	<b>RETEST</b>		60 Minutes	
4.	<b>SEMINAR / ASSIGNMENT</b>			10
5.	<b>END SEMESTER</b> Descriptive Type Examination (Unit 1,2,3,4 & 5)		180 Minutes	50

#### **Text Books**

1. Eldad Perahia and Robert Stacey, Next Generation wireless LANS 802.11n and 802.11ac, 2<sup>nd</sup> edition, Cambridge University Press, 2013
2. Mathew Gast, 802.11 Wireless Networks: The Definitive Guide, 2nd Edition, OReily, 2009

#### **Reference Books**

1. Mathew Gast, 802.11n: A Survival Guide: Wi-Fi Above 100 Mbps, OReilly, 2012
2. Mathew Gast, 802.11ac: A Survival Guide: Wi-Fi at Gigabit and Beyond, OReilly, 2012



**COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)**

1. Direct feedback from the students by having face-to-face meeting individually and as the class as a whole.
2. Feedback from the students during the class committee meetings

**COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)**

All students are expected to do their work. The taking of information by means of copying homework assignments, or looking or attempting to look at another student's paper during an examination is considered dishonest.

Also preventing or hampering other students from pursuing their academic activities is also considered as academic dishonest.

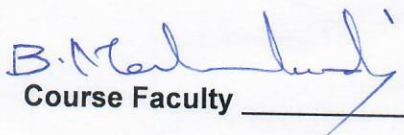
Any evidence of such academic dishonesty will result in the loss of all marks on that assignment or exam.

1. Students opting for plagiarism during exams will be summarily sent out and awarded zero marks for that exam.
2. Students honestly producing original work will be rewarded with better marks.
3. Students not having 75% minimum attendance at the end of the semester will have to repeat the course. Students who do not maintain 75% attendance between the assessments without any valid reason will be warned the first time and will be stopped from future assessments if they persists in abstaining from classes.

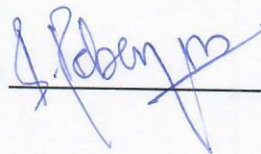
**ADDITIONAL COURSE INFORMATION**

- Students may fix appointments for detailed discussion by sending email to [malark@nitt.edu](mailto:malark@nitt.edu) two days prior to the desired appointments date with the topic to discuss. The students must come prepared for the discussion with through background preparation
- Minor doubts will be clarified after the contact hours without any prior appointment.

**FOR SENATE'S CONSIDERATION**

  
Course Faculty

CC-Chairperson



HOD

  
29.1.2020