NITK Surathkal
Department of Computer Science & Engineering
Course Plan

Name of the Course: Wireless Networks	**Course No:** CO416	**No. of Credits (L-T-P):** 3-0-0 (3)
Year & Semester, Section: 4th year, VII Sem B.Tech (CSE)	**Course Type:** PSE	**Academic Session:** July - December 2019

Prerequisites (if any): CO300 (Computer Networks)

Name and Contact Details of Course Instructor:
Mohit P. Tahiliani (Dept. webpage)

Evaluation Scheme: Quizzes and Assignments - 40%, Mid Sem - 20%, End Sem - 40%

Course Objectives:
1. Introduce different types of wireless networks.
2. Explore the design considerations of Wireless Fidelity (Wi-Fi).
3. Explain the importance of Rate Adaptation Algorithms (RAA) in Wi-Fi.
4. Understand the performance problems of TCP in wireless environments.
5. Introduction to different categories of wireless routing protocols.

Course (Learning) Outcomes (COs):
CO1: Understand different wireless technologies and their purpose of existence.
CO2: Understand the working of Rate Adaptation Algorithms, and try to reduce latency.
CO3: Ability to appreciate the importance of increasing throughput in wireless networks.
CO4: Ability to design and optimize wireless routing protocols.

Mapping of COs with POs:
(Strength of correlation: S-Strong, M-Medium, W-Weak)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	S	S	W	W	W	W	W	M	M	S	M
CO2	S	S	M	S	W	W	W	W	M	M	S	M
CO3	S	S	S	S	S	W	M	S	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	S	S	M

1. Teaching Learning Interaction:

No.	Topics	Detailed Syllabus	L-T-P hours
1	Different types of wireless technologies such as: Cellular networks, Wi-Fi, Underwater Acoustic Networks, Different versions of 802.11 such as: WAVE (802.11p), Gigabit Wi-Fi, etc, Rate Adaptations Algorithms such as: ARF, AARF, ONOE, SampleRate, Minstrel, AARF-CD, RRPAA, etc.	See: Chapter 5 to 8 from [Grigorik 2013] and other online resources shared in Piazza Virtual Classroom	16 - 0 - 0

2	Performance problems of TCP in wireless networks, Introduction to Wireless TCP, Importance of ECN in wireless networks, Different types of wireless routing protocols such as AODV, AOMDV, DSDV, DSR, etc	See: online resources shared in Piazza Virtual Classroom	16 - 0 - 0
Gaps in the Syllabus (if any)		Introduction of WiFi 6 would be helpful	
Topics beyond syllabus/Advanced Topics (if any)		Latest developments in areas of WiFi 6	

2. List of Text Books & Reference Books, Online Course Resources:

[Grigorik 2013] Grigorik, Ilya. *High Performance Browser Networking: What every web developer should know about networking and web performance*. " O'Reilly Media, Inc.", 2013.

[Online Resources] Papers on RAA, ECN, Wireless routing protocols.

3. Suggested list of Assignments / homeworks / problems / any other:
Analysis, design and implementation of wireless networking protocols. One assignment is assigned per team (three members). Network performance analysis and simulation using ns-3, packet monitoring using wireshark and tweaking network protocols in the Linux code.

4. Laboratory Instructions (if any):

5. Assessment Pattern (Use Bloom's Taxonomy to design rubrics for evaluating student performance)

Level No.	Knowledge Level	Evaluation Component				Assessment (%)
		Quizzes (5%)	Assignments (35%)	Mid Sem (20%)	End Sem (40%)	
K1	Remember	10%	15%	10%	10%	11.75%
K2	Understand	20%	15%	20%	20%	18.25%
K3	Apply	20%	20%	20%	20%	20.00%
K4	Analyse	20%	15%	20%	20%	18.25%
K5	Evaluate	15%	15%	15%	15%	15.00%
K6	Create	15%	20%	15%	15%	16.75%
						100%