GOVERNMENT OF TAMILNADU

DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI-25

STATE PROJECT COORDINATION UNIT

(Established under Canada India Institutional Cooperation Project)

CURRICULUM

Course Name	**WIRELESS COMMUNICATION TECHNOLOGY**
Course Code	**EC/2020/018**
Course Duration	60 Hours
Minimum Eligibility Criteria	10th/+2 /ITI/Diploma/Graduate
Pre-requisites (if any)	Knowledge of Basic Electronics
Course Objectives	Training module has been designed for the participants to • Understandthe concept of Cellular • Learn the second and third generation network standard • Understand the concept of Radio Wave propagation methods • Study the multiple access techniques in wireless communications.
Course Outcomes	At the end of training, the trainees will be able to • Explain the concept of cellular • Explain the second and third generation network standards • Apply multiple access techniques in Wireless communication projects
Expected Job Roles	Wireless communication Technician

TEACHING AND SCHEME OF EXAMINATION

Course Code	Course Name	Hours		Assessment Marks		Duration of Examination
				Min	Max	
EC/2020/018	WIRELESS COMMUNICATION TECHNOLOGY	Theory	24	10	20	3 Hours
		Practical	36	40	80	
		Total	60	50	100	

EC/2020/018 – WIRELESS COMMUNICATION TECHNOLOGY

DETAILED SYLLABUS

Unit No	Modules	No.of.Hours	
		Theory	Practical
I	**CELLULAR CONCEPTS**	06 Hours	
1.1	Cellular concepts- Channel reuse	02	04
1.2	Handoff strategies		
1.3	Coverage		
II	**SECOND AND THIRD GENERATION NETWORK STANDARDS**	18 Hours	
2.1	GSM standardization, Architecture	08	10
2.2	Function partitioning, GSM radio aspects		
2.3	Security aspects, Protocol model		
2.4	Call flow sequences		
2.5	Evolution to 2.5G mobile radio networks		
2.6	CDMA systems		
III	**RADIO WAVE PROPAGATION**	14 Hours	
3.1	Free space propagation model, Basic propagation mechanisms, Reflection-ground reflection model	06	08
3.2	Diffraction, Scattering,		
3.3	Practical link budget design-outdoor and indoor propagation models		
3.4	Mulitpath channel, Types of small scale fading		
IV	**DIVERSITY**	10 Hours	
4.1	Realization of Independent Fading Paths	04	06
4.2	Receiver Diversity		
4.3	Selection Combining		
4.4	Threshold Combining		
4.5	Maximal-Ratio Combining		
V	**MULTIPLE ACCESS TECHNIQUES**	12 Hours	
5.1	Frequency division multiple access	04	08
5.2	Time division multiple access		
5.3	Spread spectrum multiples access		
5.4	Space division multiple access		
5.5	Packet radio		
	Total Theory / Practical Hours	**24**	**36**
	Total hours	**60**	

HARDWARE REQUIREMENT

S.NO	LIST OF TOOLS /EQUIPMENTS
1	Adapters
2	Routers
3	Access points
4	Antennas
5	Repeaters

SOFTWARE REQUIREMENT

NAME OF THE SOFTWARE
NIL

REFERENCE BOOKS

S.NO	NAME OF THE BOOK	AUTHOR	PUBLISHER
1	Fundamentals of Wireless Communication	David Tse, PramodViswanath	Cambridge University Press , 2005
2	802.11ac: A Survival Guide	Matthew Gas	O'Reilly Media , 2013
3	Wireless Ad-Hoc Networks	Hongbo Zhou (ed.)	InTech , 2012
4	Wireless Sensor Networks: Technology and Applications	Mohammad Matin (ed.)	InTech , 2012
5	Wireless communication	Andrea Goldsmith	Cambridge University Press,2005
6	Wireless Communications	Rappaport,T.S	Pearson Education,2010

ASSESSMENT AND CERTIFICATION

S.No	Criteria for assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the CIICP Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the CIICP Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The passing criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training, certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnics.

END EXAMINATION

ALLOCATION OF MARKS

S.NO	Description	Max. Marks
1.	Theory Examination	20
2.	Practical Examination	
	a)Objective and Circuit Diagram	20
	b)Procedure and Connections / Execution	20
	c)Result and Viva	20
	d)Record	20
	Total Marks	**100**

THEORY MODEL QUESTION PAPER

EC/2020/018 – WIRELESS COMMUNICATION TECHNOLOGY

(Maximum Marks: 20)

(N.B: Answer any Twenty questions) 20x1= 20 Marks

1. Define Cell.
2. Draw a neat sketch of cellular network.
3. What is frequency reuse?
4. What is Channel reuse?
5. Define handoff.
6. What is the range of cellular network?
7. Expand GSM.
8. What are the main parts of GSM architecture?
9. What are the features of GSM?
10. What is GSM radio aspects?
11. How many types of security are provided in GSM?
12. How is a call established in GSM?
13. What is CDMA system?
14. What are the basic radio propagation mechanisms?
15. What is diffraction?
16. Define Scattering.
17. What are the propagation model under practical link budget?
18. What is fading?
19. What is frequency diversity in wireless communication?
20. What is selective diversity combining?
21. What is FDMA?
22. What is TDMA?
23. Explain spread spectrum techniques.
24. Expand SDMA.
25. What is packet radio?